FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 142. (No. 37. Vol. III.)] SEPTEMBER 16, 1911. [Registered at the G.P.O. as a Newspaper.] [Weekly, Price 1d. Post Free, 1½d.

AVIATION AT THE FRENCH MILITARY MANŒUVRES ROUND ABOUT VERDUN.—Lieut. Blard and Capt. Lebeau in their Farman biplane passing over the Kellermann monument at Valmy.

EDITORIAL COMMENT.

The Aerial Post.

We incline to the opinion that Captain Windham and his coadjutors in the organisation of England's first aerial postal service have builded even better than they knew. Primarily conceived in the interests of charity, and also without a doubt intended to furnish a demonstration of the capability of the aeroplane to lend itself to things more useful than mere spectacular flying, it has resulted in a mass of publicity being given by the Press of the country which cannot but have a very marked influence upon the immediate future of the movement. It is perfectly true that the recent Circuit of Britain obtained more in the way of detailed efforts from the pen of the descriptive journalist, and that many more of the populace were able to take an active and personal interest in the doings of the competing aviators. What that event has really done for aviation we have no means of gauging—at any rate, not until the true measure of public interest in the infant science becomes a matter of something like certainty. But its effect must have been almost incalculable, for reasons which must readily suggest themselves to every person who is interested enough to trouble to think about it at all.

As things have turned out, we are not altogether certain that the inauguration of the first aerial post does not stand on the same plane as the much more ambitious Circuit of Britain. It is something altogether different, and herein lies its great value to the movement. The one was a magnificent test of man and machine, which was necessary in order to establish the aeroplane in the eyes of the public as something which was rather more than the toy affair that some no doubt believe it. It showed that even in these days when the 'plane is undergoing constant improvement and evolution, it is possible to fly a thousand miles with the certainty and with more than the speed of an express train. We are, however, an eminently practical people, despite what our rivals may say to the contrary, and it is possible to imagine the rather nebulous personage known as the man in the street, asking of his neighbour of what really practical use is a machine which can simply carry its pilot around Great Britain in fast time? Now, we want money for the infant industry and that money has to come out of the pockets of the person who is putting that question. Therefore, he must be convinced that there is a commercial future for that industry, and what better earnest of that future could he have than the spectacle of Hamel, the first aerial mail-carrier, flying from Hendon to Windsor with His Majesty's mail-bags at the marvellous speed of well over a hundred miles an hour?

So far the venture has proved most successful, in spite of the unfortunate accident to Hubert which marred the second day's service. Thousands of people have received letters which have been carried through the air, and have been duly impressed by the wonder of it all. Thousands more will receive their aerial mail during the next few weeks, and be thereby brought face to face with the practicability of flying as a commercial and dividend-earning proposition, to the manifest benefit of the whole movement.

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Aeroplanes in War.

It may be unfortunate that the moment any new scientific discovery is made, many of the best brains of the world betake themselves to the study of it with a view to its adaptation to the art of wholesale murder. It has been so since the beginning of things, and will remain so until the end of time, unless the peace societies are able to work a metamorphosis in human nature. Naturally, therefore, the first thought of many when flying became an actual possibility, was, how it could be applied to the purposes of war—or, rather, how the utmost value could be got out of the aeroplane as a man-finding and man-killing apparatus. Something that could fly over and rain wholesale death and destruction upon an enemy has been the dream of the advanced soldier for centuries. Well, it is with us now, with all its dreadful possibilities, and, true to human nature, we are now feeling something akin to terror at the very thought of those potentialities. All of us, that is, except the men who will be called upon one day to sacrifice themselves upon the altar of country. They, with all the keenness and professional pride of the fighting caste, are rather more than cheerful about it all.

At the forthcoming Inter-Parliamentary Union Conference to be held in Rome, the question of aerial warfare is to be discussed, and it will be proposed that the use of aeroplanes, either as instruments of war or for the purposes of reconnaissance, shall be forbidden. We like the spectacle of grave parliamentarians solemnly discussing an International law making the matter illegal, the while every soldier aviator in the world is striving to make the aeroplane more perfect in itself, and, therefore, an instrument of greater deadliness. And more than that we like to think of the self-control and the scrupulous regard for the code of the game which would keep, for example, the French military aeroplanes in their sheds on the declaration of hostilities with, let us say, Germany. It would be magnificent—but it would not be war. Frankly, it is a waste of time for these conferences to busy themselves with such matters, for until the complete reversal of that dominant quality in men which we call human nature, we shall each do our best to secure that our friend the enemy shall die the quickest, untidiest, and most comprehensive death we can arrange for him. The aeroplane, the submarine, and the new "thirteen-point-five" are all means to this end, and we shall go on improving them until the Millennium, in spite of all the pious resolutions of all the peace conferences that have sat and are still to sit.

* * *

"Training for the Nation."

While the Inter-Parliamentary Union is preparing its "swords into ploughshares" resolutions, Dr. Mansfield Robinson says: "I am training my boy for the nation." That is, he has determined that as our future wars will be fought out largely in the air and if we are to preserve our integrity as a nation we must be properly equipped for all the eventualities, he will dedicate his son to England's air service. It may sound a little theatrical in its expression, but that matters nothing. The true note of patriotism rings out in it as a welcome variant from the too general apathy with which the services, it is to be feared, are regarded in these piping times of peace. Dr. Robinson's son, Naval-Cadet Leo Mansfield Robinson, is learning to fly a Deperdussin monoplane at Brooklands and has already made several very successful flights. The youngest aviator in England—he is only a little over fourteen—he is by way of an enthusiast and as determined as his father that he will become one of the devoted band who, when "The Day" comes, will cheerfully go forth to face all the unknown terrors of war in the air.

FLIGHT PIONEERS.

LIEUT. B. H. BARRINGTON KENNETT,

One of the most prominent aviators in the British Army.

INAUGURATION OF THE FIRST AERIAL POST OF THE UNITED KINGDOM.

LAST Saturday was one of those occasions on which the London Aerodrome awakens out of its customary work-a-day existence and appearance and assumes a gala-day aspect. Thousands must have directed their steps to Hendon, for not only were the enclosures comfortably filled but the slopes overlooking the aerodrome served as natural grand stands to those who were content to witness the inauguration of the First Aerial Mail from a distance. For such a crowd to assemble when the chances of seeing flying were remote was a sure indication of the interest that has been aroused in the public mind by the aeroplane post conceived by Capt. W. G. Windham, and engineered, with the assistance of the Postmaster-General, by him and Mr. D. Lewis Poole. At the aerodrome on Friday evening there was an enormous demand for the special post-cards and envelopes and many people sallied out from town in taxicabs to post their missives at the special box provided on the ground in the hope that their communications would be amongst the first batch delivered to Windsor by aeroplane.

The weather conditions were far from being suitable for the occasion and many of those who had extensive aerodrome experience volunteered the opinion that the mails would not be delivered to Windsor that day. M. Salmet, however, proved the possibility of flying, at least on a fast monoplane, by bringing out his Gnome-Blériot and performing many figures of eight in the gusty wind. His struggle with the wind was thoroughly appreciated by the crowd and did much to sustain interest, a task with which the military band had previously been entrusted.

At half-past four Greswell's machine, "Aerial Mail No. 1," was wheeled from its hangar to the front of the Committee enclosure where Gustav Hamel, who had volunteered to pilot it, took delivery of the first mail bag and stowed it away on the machine, after having been presented, together with the other aviator-postmen, with medals by Mrs. Grahame-White to commemorate the occasion.

Hamel made his departure at 4.55 amidst a scene of great enthusiasm, and rising to 500 ft. was soon out of sight, travelling at a tremendous speed in the following wind. Considering its gusty nature Hamel kept his Blériot extraordinarily steady and seemed quite at home in the disturbed element. Soon after his departure Salmet made another flight on his Gnome-Blériot. Meanwhile Hamel had made a swift journey to Windsor where he landed at 5.8 p.m. in a meadow on the Royal farm close to the predetermined spot, after having maintained a speed over the 19 miles of something in the neighbourhood of 105 miles an hour. The mail bag, which contained messages for His Majesty the King and many of his regal kinsmen abroad, was taken from him and delivered by Mr. A. T. Avard, the Windsor Postmaster, to a postman mounted on a bicycle—now a rather more prosaic form of locomotion—for conveyance to the local post office.

On the ground Mr. Hamel was received by the Mayor of Windsor, Sir Frederick Dyson.

Of the two biplanes that were to have made the trip to Windsor only one appeared. It was Hubert, who, as game as usual, was determined to fly his Farman round the aerodrome even if he fought shy of a cross-country flight under such exacting conditions. He was blown about a good deal and one could see that he was having a bu-ier time than would be relished by most pilots.

Hamel's return to Hendon was spectacular in the extreme. He appeared above the aerodrome at a height of 2,000 ft., and, cutting off his engine, made a magnificent spiral glide to earth. Naturally everyone was anxious to congratulate him on his splendid achievement, and a wild rush was made to his machine. Congratulations, Hamel evidently thinks, are necessary evils that one has to put up with on such occasions; but when he noticed an ominous determination on the part of his admirers to "chair" him, he lost little time in making for the refuge his hangar would have afforded him. He was, however, "collared" on the way, and forcibly chaired by his enthusiastic friends, who kept him shoulder high until a photographer had taken an indelible record of the episode.

A painful incident marred the resumption of the Aerial Post service on Monday last. The three pilots of the Grahame-White Co., Greswell, Hubert, and Driver, had made preparations to fly over to Windsor with a further delivery of mails. Greswell on his Blériot and Driver on one of Grahame-White's Farman machines got away with their supplies of mails soon after 6.30 a.m. Hubert, who was to have followed them, was not so successful, for as he was making a circuit, preliminary to striking out for Windsor, a gust struck him and he came heavily to earth in an effort to restore his balance.

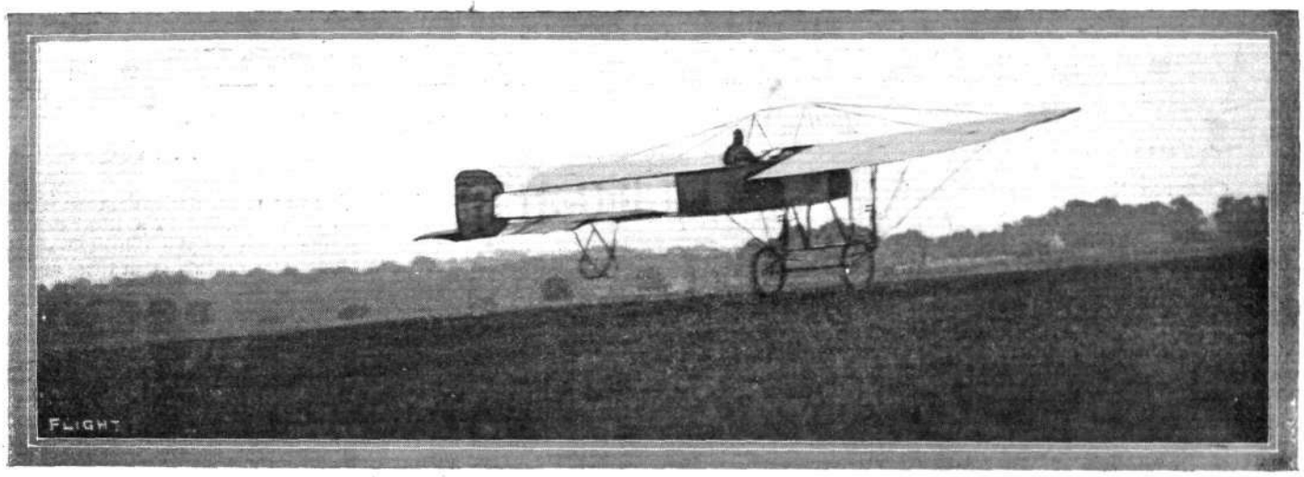
The military machine that he was flying has been a *bête noir* amongst Grahame-White's pilots, and although Hubert possessed a deep-rooted hatred for it, on the score that it was extraordinarily sluggish in answering to the controls, he was always more or less "dared" into flying it. Hubert had had two previous accidents on the same machine, and while the writer was helping to nurse him out of the slight brain concussion caused by his last accident, he swore that he would never fly the machine again unless the weather conditions were as near perfect as possible.

Poor Hubert would have hated to have seen his fellow pilots get away to Windsor without making some attempt to follow, although he knew full well by experience that his machine was much less suitable for wind-flying than theirs were. His accident was the result, for by the time he was ready to start, the wind had risen, and, in making his first circuit, the machine was caught in a nasty gust, and failing to respond to Hubert's lever movements, was dashed to the ground. He was considerably bruised, and suffered serious injury to both his legs. We are sure our readers will join with us in wishing him a rapid recovery.

Greswell and Driver made good passages to Windsor, where they delivered between them six bags of correspondence.

Through a defect in his engine Greswell was unable to return to Hendon, and Driver mistaking his return course,

THE FIRST AERIAL POST OF THE U.K.—Mr. Gustav Hamel receiving officially from the postman the first bag of letters at Hendon for conveyance to Windsor Castle on his Bleriot monoplane. In the centre is Capt. Windham, who is the originator and chief organiser of this service, as well as of the aerial post which was established recently for a short period in India.



THE FIRST AERIAL POST OF THE U.K.—Hamel leaving the Hendon Aerodrome on his Blériot for his 108-m.p.h. journey to Windsor on Saturday last.

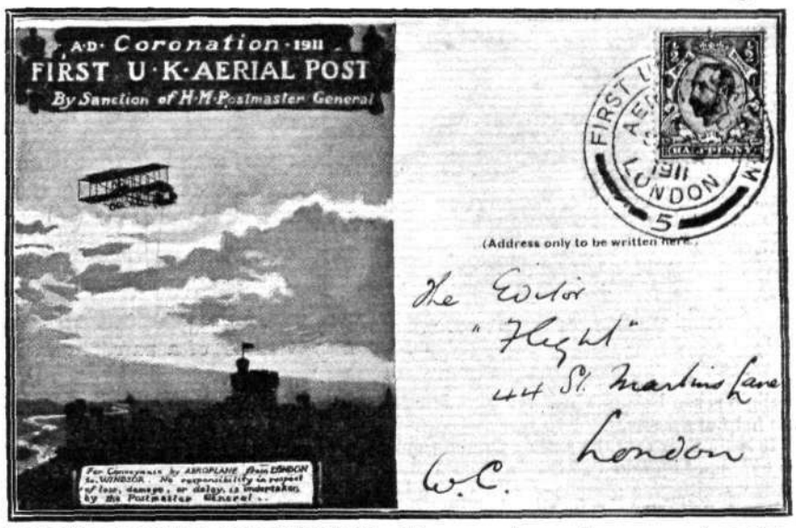
landed on Nazeing Common, a point some twenty miles north of London. Gustav Hamel made another trip to Windsor on Monday evening delivering two mail bags and yet another on Tuesday evening, Greswell making a trip in the morning and Driver two trips. The following are the times of the various outward journeys with the number of mail bags conveyed :—

Aviator.		Left. Hendon.	Arrived Windsor.	No. of bags.
Saturday—				
Hamel	...	4.58 p.m.	5. 8 p.m.	1
Monday—				
Driver	...	6.30 a.m.	7. 5 a.m.	4
Greswell	...	6.35 a.m.	7. 0 a.m.	2
Hamel	...	6.15 p.m.	6.45 p.m.	2
Tuesday—				
Greswell	...	6.10 a.m.	7.40 a.m.	2
Driver	...	6 22 a.m.	6.52 a.m.	4
,,	...	8.43 a.m.	9.13 a.m.	3
Hamel	...	5.58 p.m.	6.31 p.m.	2

Greswell's time of arrival at Windsor on Tuesday is accounted for by his having lost his bearings through a haze which he had to fly through, and having to descend at Slough to ask his way.

So much general interest has been aroused by this novel method of delivering mails, that doubtless a great deal of the public's appreciation of the aeroplane is dependent on the regularity with which the service is maintained. On the other hand, although great strides have been made in wind flying, on account of improvement in design of the machine and greater confidence and skill on the part of the pilot, it must be confessed that the day of the weather-indifferent aeroplane is not yet at hand. Under these circumstances it is to be hoped that those pilots to whom the service has been entrusted will not be tempted to take any undue risks, for it is certain that a serious accident connected with a scheme that is at present so much in the public eye would have a greater adverse effect on the lay mind's estimation of the aeroplane than would be caused by any slight disorder in the methodical running of the service.

On Wednesday the severe weather made it impossible for the service to be carried out.



AN HISTORICAL DOCUMENT.—By way of record we reproduce the above postcard, despatched by the First Aerial Post of the United Kingdom on Saturday last, and addressed to the Editor of FLIGHT, one of many which we received from our readers by way of a little compliment. We hope that the suggestion of our correspondent in this case on the reverse side of the card, may materialise in time to come. His message reads as follows: "This card ought to be worth £10,000,000,000 to FLIGHT in a few years time. *Je ne pense pas!*"

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Cross-Country Flying on Bristol Monoplanes.

A VERY fine cross country flight was made on Monday evening on one of the new Bristol monoplanes by Mr. Graham Gilmour. Leaving Amesbury at 6 o'clock he set out for Devizes, but owing to the mist which prevailed he got off his course and failed to find either Devizes or Chippenham. He continued on for some time, however, and then recognised a large town which loomed up on the left as Bath. From there he steered a course to Bristol, but close by Brislington thick smoke clouds obscured his vision and he had to fly entirely by guesswork. He judged his direction very accurately however, and recognising the works of the British and Colonial Aeroplane Co. at Filton by their white roofs he planed down steeply from about 500 feet into the field at the back, landing at exactly twenty minutes past seven. During the trip of fifty minutes he must have covered between 70 and 80 miles. Mr. Gilmour expressed himself as delighted with the ease and control of the Bristol monoplane.

The Importance of Details.

IN a letter to the Press, M. R. Esnault-Pelterie states that as a result of inquiries conducted by himself, and also by the military authorities, the conclusion has been reached that the fatal accidents to Capt. Camine and Lieut. de Grailly were caused by the use of glue for fastening the fabric at the trailing edges of the main planes. The wings were, moreover, not made by M. Pelterie, and in spite of his protests the use of glue was persisted in.

The tragedy is a terrible lesson as to the need of paying attention to what may appear but minor points in construction, and M. Pelterie suggests that the use of glue may have been due to a negligent workman.

Both the unfortunate officers, in spite of the condition of their machines, by their skill were able to very nearly reach the ground safely, but Capt. Camine's monoplane ran into a bank and was wrecked, while the petrol tank, for some unexplained reason, burst on Lieut. de Grailly's machine.

A Study of Bird Flight

By Dr. E.H.Hankin. M.A. DSc.

CHAPTER XII.—Some Independent Evidence.

AN article entitled "On the flight of birds" was published over the initials "A.O.H." in "Stray Feathers," vol. x, No. 4, p. 248, July, 1882.

The author made his observations at Simla, at an elevation of about 7,000 ft. in the Himalaya mountains. He states that vultures start in the summer between 6 and 7 in the morning, but in winter not till nearly 9 a.m. Their usual speed of flight, presumably flex-gliding, he found to be from 12 to 15 miles an hour. He states that crows soar, rising in circles without flapping when the air is quite calm. My own observations made in the Himalayas at Naini Tal confirm this statement, but qualify it in so far that in my experience the presence of bright sunshine besides calm air is necessary for the soaring of crows.

The author quoted puts forward a theory of the nature of soaring flight. He states that it is due to "levitation." This is a miracle or conjuring trick in virtue of which a man can remain unsupported in the air. He says that it consists in "so altering the magnetic polarity of the physical frame that in lieu of being attracted it is repelled by the earth." This power is achieved "by living an absolutely pure life and intense religious concentration." Birds are endowed with this power apart from such mental exercise, unless, it may be suggested, the hill crow finds it helpful to indulge in irreligious sentiments when trying to descend to *terra firma* without the help of gravity.

It is singular that the author should think that such a theory is an explanation, and also that he should think it right to publish such a theory without a particle of evidence in its favour.

That an observer should be led to formulate such a theory is, however, of interest in showing that soaring flight, when seen at close range, is actually a mysterious phenomenon inexplicable by causes hitherto suggested.

CHAPTER XIII.—Further Consideration of Circling.

In view of the knowledge now gained of directive movements, a further description of circling may be attempted.

The first steering movement in circling that I discovered is one that I propose to term the "windward dip."

If a circling bird is carefully watched at the end of the windward gain of height, a slight downward dip of the wing tip of the wing that is nearest the centre of the circle may be observed. This windward dip may be seen occasionally in all species of soaring birds that have come under my observation, including both vultures, cranes, and adjutants.

While watching a cheel circling a few feet over the roof of my house where I was sitting at the time, I noticed the windward dip in two or three circles. Then in the following circles, at the point in the track where one might expect to see the dip, a sudden wing depression occurred. That is to say, the dip was replaced by the other kind of steering movement that has been described. This steering movement was seen to be followed by a slight rotation of the bird, that is to say, by a slight change of course.

In cases in which a leeward gain of height occurs, this gain may similarly be followed by a "leeward dip."

Both with the white scavenger vulture and the black vulture I have on rare occasions noticed that at the time of the windward dip the whole of the inside wing was momentarily depressed, and that the outside wing was also depressed, but to a lesser degree. In view of the description of the effect of the dihedrally-down position given in Chapter IX, it appears probable that these adjustments have the object of increasing speed.

In leeward looping the windward dip may often be seen. At the leeward end of the glide a dip of the inside wing may occur, evidently with the object of turning the bird round to face the wind. After the windward gain of height, the windward dip may be seen. Then, when in consequence the bird turns round (to a direction facing away from the wind) to commence the next leeward glide, I have, in the case of the cheel and the white scavenger, frequently noticed a depression of both wings to a slightly marked dihedrally-down position. This adjustment only lasts for a second or two, and its function appears to be to produce or initiate the increased speed of the leeward glide.

Several months' study was requisite to discover the above facts of directive movements in circling. After several more months' study I discovered smaller movements of the tip of the outside wing that occasionally occur. These movements appear to be of a somewhat complicated nature, and I propose discussing them on a future occasion.

On rare occasions, and if one is favourably situated for observation, other dip movements of the inside wing tip may be seen. These are of lesser amplitude than the dip movements already described.

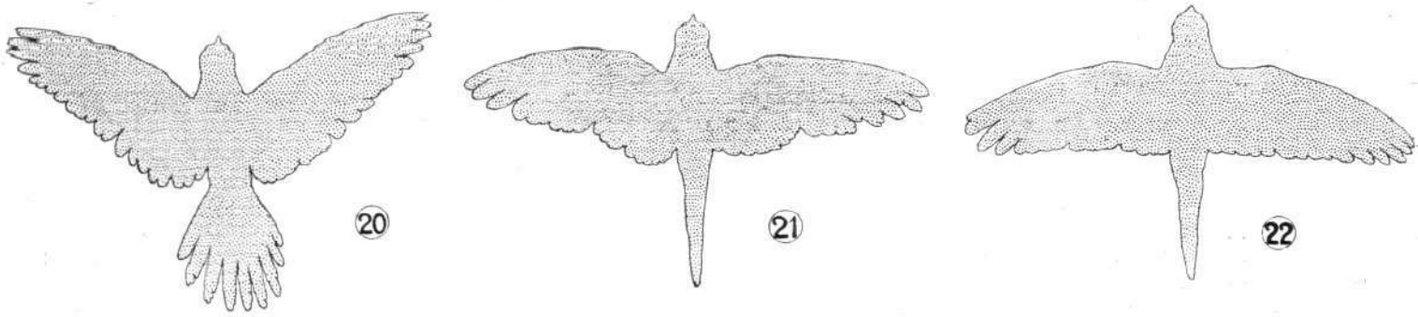


Fig. 20.—Outline of a parrot with wings advanced. Fig. 21.—Outline of a parrot with wings straight. Fig. 22.—Outline of a parrot with wings retired.

The extraordinary fact about these different movements is that they do not always occur. Sometimes I have observed carefully, perhaps as many as a hundred birds without once seeing a windward dip. Sometimes at Jharna Nullah, out of thousands of birds circling together none show any such movements. Presently a cluster of birds may be seen to detach themselves from the rest, and commence drifting to leeward. Every bird in this cluster that can be observed will be found to show strongly marked windward dips. Another cluster of birds drifting to leeward may show scarcely any such movements.

The bird is always canted over towards the centre of the circle. If the air is fully soarable the wings of the vulture when circling are in the dihedrally up position. On the down-wind side, especially at the commencement of the down-wind side of the circle, the dihedrally-up angle is less, or the wings may for a short period be held nearly flat. When circling in less soarable air, the dihedrally-up angle also is less, and in this case along the down-wind side of the track the wings may be held flat.

But whether the wings are flat or dihedrally-up, their centre of effort is always above the level of the centre of gravity. It might be suggested that the canted position in circling is connected with this fact, in that it might be due to an effect of centrifugal force. But this supposition is clearly negatived by the fact that the amouut of canting is greatest on the windward side of the track, where speed is least. Canting is least on the down-wind side where the speed is highest. On the windward side of the track the bird may be canted up to such an extent that the plane of its wings (supposing they were flat) may make an angle of between 30° and 60° with the horizon.

The amount of canting varies at different times without any very obvious cause. I have formed the impression that in ease-circling

there is less canting than there usually is in circling with effort to gain height.

We may hope to understand these facts when we have more knowledge of the method by which the bird obtains energy from the air. Having finished the subject of this chapter, I now pass on to consider a point of nomenclature. The accompanying figures represent outlines of the green parrot (*Palaeornis torquatus*), a bird common in Agra and that has the power of very rapid flight.

Fig. 20 shows the outline with the wings in what I propose to call the "advanced" position. This disposition, as will be further described in a later chapter, occurs when the bird is about to perch. The centre of effort of the wings is, as shown in the drawing, some way in advance of the centre of gravity. The outline of a dove under similar conditions would be similar, with the addition that the alulæ would be seen to be extended.

In Fig. 21 a parrot is represented with the wings in the position that I propose to call "straight." The wings leave the body at a right angle. Their centre of effort is on the same level as the centre of gravity. This position is seen in rapid flapping flight in a horizontal direction. The wings are shown slightly flexed, as is usual in flapping flight.

In Fig. 22 I have shown the wings in the "retired" position. This is the position assumed by the wings of a parrot when it is in flapping flight in a downward direction. The centre of gravity is, as shown in the drawings, very slightly in front of the centre of effort of the retired wing. The wings are also retired when the parrot is gliding downwards without flapping. In this case, besides being retired, the wings are held in the dihedrally-down position. When thus gliding with the wings dihedrally down, the centre of effort of the wings is very slightly above the position of the centre of gravity. The centre of effort of the wings is only below the centre of gravity during a double dip movement, that is to say, while the bird is rotating round the transverse axis.

CHAPTER XIV.—The Progressive Change in the Soarability of the Air in the Morning.

In an earlier chapter I stated that there is a gradual increase in the soarability of the air during the morning, as shown by the fact that different species of birds commence circling at different times.

Some of my observations are summarised in the following table. The figures are the number of minutes that elapsed between the first circling of cheels and the first circling of the different species of birds mentioned :—

	February								Mar.	Apr.
	6th.	13th.	14th.	15th.	19th.	20th.	23rd.	24th.	10th.	11th.
White scavengers ...	34	41	15	58	38	37	27	68	26	11
Common vultures ...	41	47	54	62	38	74	48	75	35	32
Black vultures ...	70	79	68	62	65	41	48	75	50	51

That is to say, on February 6th, 1910, for instance, white scavenger vultures began to circle 34 minutes after cheels had commenced circling. Common vultures began 41 minutes and black vultures 70 minutes after the first circling of cheels.

Always, without exception, the lightest bird, namely, the cheel, is the first to start. Its load is ·55 lb. per square foot of wing area.

The cheel is usually followed at an interval of between 20 and 40 minutes by the white scavenger vulture, whose load is ·87 lb. per square foot.

The common white-backed vulture, having a load of 1·13 lb. per square foot, may be expected to start between 40 and 60 minutes after the cheel.

The black vulture has a load of 1·23 lb. per square foot ; usually starts between 60 and 80 minutes after the cheels.

The adjutant bird (*Leptoptilos argala*) has a load of 1·54 lb. per square foot of wing area. I have observed it starting about 120 minutes after cheels. Though adjutant birds usually emigrate from India after the rainy season, about half a dozen have remained in Agra during the present cold weather. On several occasions, at Jharna Nullah, during the colder months I have noticed that the soarability of the air was not sufficient to support the circling of adjutants. Either they remained settled, or, if they commenced circling for a few minutes in the middle of the day, they soon found occasional flaps were necessary to keep them aloft and presently returned to earth.

Judging from a few observations, cranes appear to start some time after black vultures. I have not yet had an opportunity of measuring a crane (*Grus communis*), but I have made measurements of an allied species, namely, the sarus (*Grus antigone*). Its load was found to be 1·66 lb. per square foot of wing area. This bird is not known to have the power of soaring.

Thus the times at which different species of birds commence circling furnish a proof of the gradual development of morning soarability.

An interval always occurs between the time of commencement of circling and the time of commencement of flex-gliding. Also, slow flex-gliding begins before fast flex-gliding.

The following extract from my diary is an interesting case, showing the interval between the air being suitable for circling and its becoming suitable for flex-gliding of the same species of bird :—

April 11th, 1910, at 8.15.—Widespread circling of cheels began.

8.16.—Diherally-up position of wings first seen in a cheel ; one at low level.

8.26.—Scavengers starting and circling.

8.42.—Cheels circling at high level ; still had wings dihedrally-down.

8.47.—A large vulture circling.

8.51.—Three more vultures starting and circling.

8.56.—During the last five minutes 36 vultures were seen flap-gliding to leeward, all rather low down (probably at a height of about 100 metres).

8.59.—Thirteen more vultures flap-gliding to leeward.

9.1.—Twenty more flap-gliding to leeward.

9.3.—Nine more not flap-gliding, but rapidly flex-gliding to leeward.

9.5.—Four more flex-gliding to leeward.

9.6.—Black vulture starting. Wind west ; strong enough to move smaller branches, but showed a tendency to drop.

Though I described these vultures as "rapidly flex-gliding" to leeward, it is probable that they were "slow flex-gliding." Their flight may have appeared rapid because they were unusually low down, and because they were travelling with the wind.

I have never seen anything like this phenomenon before. The vultures nearly all started from a point out of sight to windward, and went to some point out of sight to leeward. They must have commenced gliding before they had time to circle to any great height. That is to say, they can scarcely have been in a position to see other vultures diving from a height on to carrion, for instance, at their objective to leeward. It seems more probable that they had left their roosting places the moment the air was soarable in order to go to some food that they had left uneaten the evening before. They were advancing over a front certainly more than a mile wide. Their sudden change from flap-gliding to flex-gliding, therefore, indicated a widely-spread change in the condition of the air.

That slow flex-gliding occurs before fast flex-gliding is illustrated by the following extract from my diary. I have inserted comments in brackets :—

October 26th, 1910.—Wind west. Could not be felt till 10.16, when it was just sufficient to move leaves.

9.10.—Widespread circling of cheels began. 19 cheels up.

9.14.—28 cheels circling in city. Of these 3 at high level flap-circling. (I have not seen high level flap-circling since last cold weather. During the monsoon season, July to September, as soarability develops, air at a higher level seems frequently to be more soarable than air at a low level.)

9.20.—Flex-gliding of cheels beginning.

10.10.—112 cheels up circling over city.

11.12.—5 vultures and one brown vulture seen starting. At first they flap-circled.

10.14.—These vultures were either circling without flapping or flap-gliding up wind.

10.16.—6 vultures seen slow flex-gliding direct to leeward for about 300 metres distance. They then again circled, but with wings more advanced than had been the case at the commencement of circling.

10.30.—A vulture seen slow flex-gliding up wind with loss of height. Once it was seen to flap for a few seconds.

10.35.—A vulture slow flex-gliding beam on to wind without loss of height. Wing tips slightly retired.

10.40.—7 vultures flap-gliding up wind at low level.

10.47.—A black vulture circling. Vultures slow flex-gliding up wind at high level. Other vultures, at lower level, flap-gliding up wind.

10.50.—3 vultures fast flex-gliding to leeward.

10.53.—2 vultures flex-gliding up wind with slight relaxation of secondaries. (This adjustment, as will be explained in a later chapter, indicates flex-gliding at medium speed.)

10.58.—A vulture fast flex-gliding up wind.

10.59.—An eagle fast flex-gliding up wind.

In a later chapter, when describing certain influences that tend to diminish soarability, I shall bring forward further proofs that flex-gliding demands more air energy than circling.

Before widespread soarability is established, it sometimes happens that soarability for cheels occurs for a few minutes over a small area (perhaps half a square mile). As this temporary soarability dies away, the cheels that had been circling (with gain of height) may glide down steeply and settle. On the other hand, they may glide down to a distance with very gradual loss of height. If they glide down in this way to leeward, it is a sign that soarability will not be established for some time. If they glide down in a windward

direction, the loss of height will be more marked, and so doing is a sign that soarability will develop with a few minutes.

In the case of cheels, there is commonly only a slight difference between the dihedrally-up and the dihedrally-down position of the wings; that is to say, the dihedral angle, whether up or down, is usually small. Hence it is somewhat difficult to see in circling cheels whether the wings are dihedrally-up or not. In the hot weather, cheels usually appear to circle (if circling with effort to gain height) with the wings in the dihedrally-up position. In the cold weather, cheels usually circle with the wings held flat, or sometimes with the wings dihedrally-down. During February, March, and April, 1910, I made a number of observations on this point, from which it appeared that in February and March cheels commonly held the wings flat at the time of commencement of circling, and only employed the dihedrally-up position about 10 to 20 minutes later. In April the interval was less, or the dihedrally-up position was used from the commencement of circling.

As soarability develops the first flex-gliding to occur may sometimes be seen to be accompanied by loss of height, as shown by the following extract from my diary:—

December 29th, 1909. At Jharna Nullah. Light west wind.

9.50.—Cheels began circling without flapping.

10.25.—White scavenger vultures began circling without flapping.

10.30.—Vultures flap-circling and circling by 10.40. At this time a column of birds was seen breaking-up. The cheels in this column all flex-glided to windward, but the vultures went to leeward by flap-gliding to join another column of birds.

10.35.—It was noticed that all cheels, flex-gliding to windward, showed loss of height, or drop and rise alternately, the drop predominating.

10.55.—Cheels now were flex-gliding to windward horizontally. On other occasions I have made similar observations.

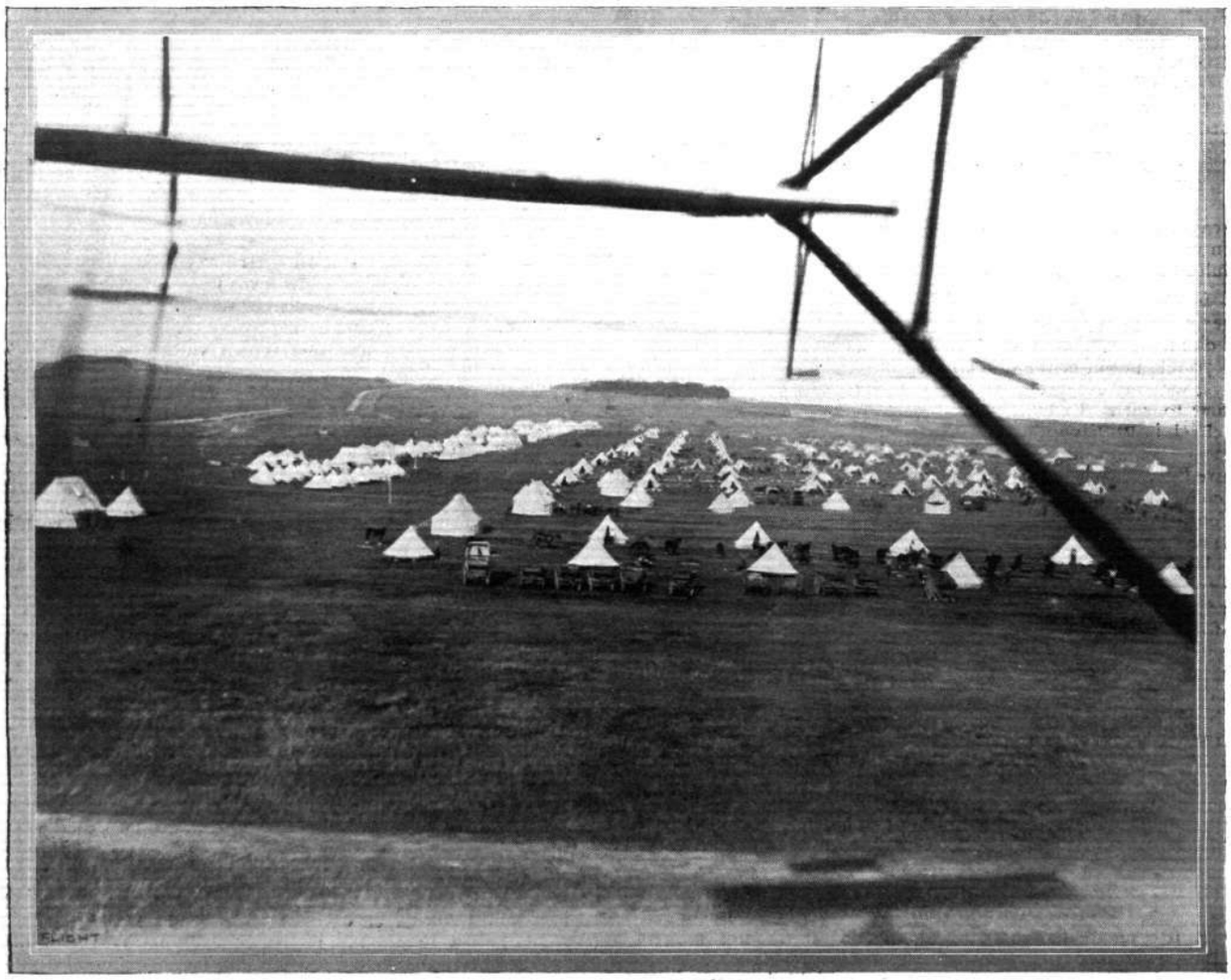
(To be continued.)

"Superior" Aviators' Certificates in France.

So great has been the number of civilian aviators who have applied for the French Superior Military Certificate that General Roques, Inspector of Military Aeronautics, has asked the Aero Club of France to undertake the official observation of the flying tests. To obtain the certificate aviators have to make three flights of 100 kiloms. each over a course marked by two posts placed 50 kiloms. apart and they must land on the same ground that they start from and within a kilometre of their initial starting point. Their height must not be less than 300 metres and this will be registered by a barograph. The tests will be varied from year to year by the Inspector of Military Aeronautics, to keep pace with improvements made.

How they Do It in France.

IT is to be hoped that those who control the destinies of aviation at the War Office will not overlook the fact that considerable sums have been allotted in the French Budget for military aviation. For the construction of new machines, &c., the sum put down is 12,558,600 francs, or 4,750,000 francs more than last year. For maintenance and establishment charges at Chalais Meudon, Vincennes, and the different military aviation centres the sum is 4,421,750 francs, for the recruiting of new employees 20,000 francs is to be set aside, for insurance the amount is 50,200 francs, while 3,000 francs is allotted for target practice. Altogether the Budget of 1912 puts down 17,053,550 francs for military aviation.



AEROPLANES AND THE BRITISH ARMY.—A general view of Hamilton Camp, Salisbury Plain, where the 4th Cavalry Brigade are encamped in readiness for the divisional training. This picture was secured on Thursday morning of last week, at réveille, from the biplane of Lieut. Barrington Kennett, who has been putting up such splendid flying work recently. Note the shadow of the biplane in the extreme foreground.

FROM THE BRITISH FLYING GROUNDS.

Brooklands Aerodrome.

QUITE a goodly crowd assembled at Brooklands on Wednesday last week to see a very interesting evening's flying; in fact, the number of people brought to one's mind the early days when flying was a rare and strange thing, and an aviator could be described by that time-worn and hoary expression, a *rara avis*. To go into details, the Deperdussin school, who believe in hard work and are having considerable success to start with, had both their machines at the disposal of pupils and instructors. Lieut. Porte was the first to ascend, and rising easily, in a manner which reminded one of a Gnome-Blériot, completed three or four circuits in excellent style, banking at the turns and showing remarkable stability. Bell next took the machine up for a few circuits, and demonstrated, by the fact that he had only been up a few times before, the ease of control of the machine. Lieut. Chinnery also did some rolling. This was his second lesson. He made some excellent straight runs and will soon be in the straight flight stage. Mr. Chataway, an Egyptian gentleman, and Mr. Sabelli, an Italian gentleman, have just joined as pupils.

Herbert Spencer was flying on his Spencer-Farman, carrying a passenger very well indeed. This apparently makes no difference at all to the flying of the machine, and the rate at which the machine travels is much greater than that of the ordinary Farman. This machine differs from the Farman in the respect that it is double surfaced. The double surface probably produces a better stream line form and is certainly more efficient in practice. Mr. Spencer with Mr. Poynter carried out some interesting experiments in "bomb" throwing, the "bombs" consisting of a paper bag filled with flour and stones. Mr. Spencer got up to a good height in his biplane, and flying over an arranged target, Mr. Poynter, his passenger, dropped the "bombs," which fell within a yard of the spot, the flour showing the hit and also rising like smoke. Three "bombs" were tried in this manner with good results. The Bristol pilots Pizey and Fleming were out doing figures of eight, banking well at the turns. They evidently find their new machine a success. Captain Richey, R.A., one of the many officers stationed in India who are taking up flying so enthusiastically, was making very clean straight flights. He informs me that Indian officers are very keen on keeping themselves *au fait* with everything and anything which will be of use to the Service. How fervently does one desire that their enthusiasm and loyalty might be emulated by their superior officers at the War Office! It is to be hoped that after laying out a great deal of money and spending much time on their own improvement they will soon receive the recognition they deserve. Petre, the instructor at the Hanriot school, was up with his sturdy little Hanriot, the engine breathing stentoriously. The angle at which this machine banks on the turns is somewhat alarming to those not accustomed to its little ways, though it is always delightful to watch. Petre's pupil, H. Rippen, was making straight flights and seems to be getting the hang of things nicely.

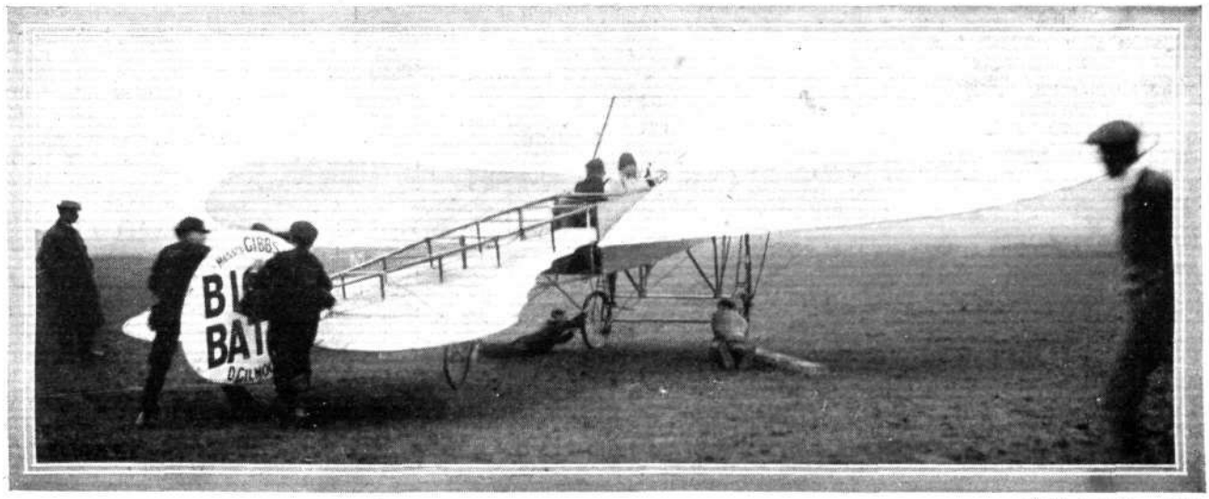
On Thursday a great deal of flying was again seen, evolutions being carried out by Bell, Porte, Spencer and the Bristol Company. The Hanriot was also piloted by the school instructor. C. Pashley, who, with his brother Eric, has purchased the Humber monoplane, was out with the machine but had some difficulty with the engine as the water jackets were leaking slightly. We hope to see him flying well when this defect has been remedied. Late in the evening, just as it was getting dark, the Universal Aviation Co's Sommer biplane was brought out, and flew a circuit in good style. This machine carries the Gnome which has had various parts, such as rockers, &c., made and replaced by an English firm. The work seems to have been very successful.

On Friday Raynham was flying the Avro-Farman, but finding that the engine was not giving the required results, decided to have the engine taken out, and the propeller changed.

The Bristol pilots were again very busy instructing their pupil, Capt. Richey, whilst Petrie and Rippen were again out on the Hanriot, the latter making excellent straight flights. On this evening the new Avro biplane was first brought out of its shed. It presented a very smart appearance, and is constructionally a great advance on former Avros. This machine is not designed to carry a passenger, although a similar one was used earlier in the year for this purpose, and achieved the remarkable feat of lifting 25 stone to a height of about 500 ft. with a 30-h.p. Green. However, the engine was not thoroughly tuned up and at the last moment it was found that the petrol pipe was not quite clear. Maurice Ducrocq made his first appearance on his Farman since his successful flying at Workington. He did several circuits in excellent style. I should think the Gnome he has is one of the best ever turned out by the Gnome firm. Saturday was practically speaking a blank day with the exception of the Bristol and Spencer machines.

Sunday was an excellent day. Quite a number of people turned up and I am glad to say did not go away disappointed. All the schools were in good going order and some excellent flying was put up by Bell, Porte, Pizey, Fleming, Spencer and Petre.

On Monday morning the weather was beautifully calm and all the schools were busy. The Avro school was out testing the new biplane and Raynham flew it in excellent style for two or three circuits although the engine was not completely tuned up. Ducrocq was up on his biplane making short cross-country trips. The Deperdussin school assembled in force, some of the pupils indulging in terrestrial gyrations. Garne was doing very good straight flights and has decided to make a turn at his next essay. In the evening the Avro biplane was out piloted by Raynham flying strongly. In appearance it is very smart and it should stand a fair chance in the Michelin competitions for which it is to be entered. Kemp, on the Flanders monoplane, was flying excellently at a good altitude, and on Tuesday morning he took up the designer and constructor, Mr. Howard Flanders, for an extensive trip. The Deperdussin school was again busy, the chief item of the programme being the photographing in many positions of the "gift to the nation." Gordon Bell, the school instructor, took the machine up for three or four circuits in masterly fashion, landing with a fine *vol plané*. Capt. Richey, on the Bristol, made some very excellent figures of eight, but landed rather heavily, luckily doing no damage. He should be able to get his ticket very shortly. One of the Bristol pupils, Bretherton, succeeded in getting his *brevet* in very good style, his banking on the turns affording a fine spectacle. The Avro school were out with their new biplane. Mr. Wheatley was having his first rolling practice, making excellent progress, and



"Flight" Copyright.

Mr. Astley, on "Big Bat" Blériot at Brooklands recently, just getting away with a passenger.—Note the mechanics on the ground helping to hold back the machine by the skid wheels.

was very pleased with the ease with which the machine is controlled. He is the first schoolmaster to take up aviation, as he is a master at Epsom College. Sidney V. Sippe was in the air, and made two or three turns in good style. Raynham then ascended with the machine and made a few circuits, but could not rise to any great height, as the planes had not been doped, and were slightly porous. In the evening the wind dropped, when Noel flew the Avro-Farman for a few circuits. He then handed the machine over to Hunter, who succeeded in making a right-hand turn, although the engine was not up to the mark. Spencer followed with a good flight of seven circuits, rising to a good height. Pizey and Fleming were up, the former doing switch-back flight, landing with a steep *vol plané*. Capt. Richey was doing figures of eight, showing his mastery of the machine while passing through the wash from Spencer's propeller. Kemp was flying on the Flanders machine, taking Brown as his passenger. Maurice Ducrocq was again doing cross-country flights, and also carried a lady passenger. The "Big Bat," piloted by Astley, did three or four circuits, but seemed to be unable to rise. Mr. Blondeau and Mrs. Hewlett have been away on an engagement to fly at Plymouth Regatta this week. Blondeau was flying on Monday, but on Tuesday trouble ensued with the authorities, by reason of a little delay through a faulty valve. Unbecoming impatience amongst the crowd caused friction, with the result that both aviators closed up the dispute by handing back their fees to the promoters.

Brighton-Shoreham Aerodrome.

THE most important items of the past week were contributed by Valentine. On Wednesday afternoon he carried out some fine evolutions here before proceeding to Preston Park, where he put up a splendid exhibition before a large gathering at the Motor Gymkhana held by the Car Section of the Sussex Motor Yacht Club. On returning to the Shoreham Aerodrome he was warmly received by a considerable number of enthusiastic spectators.

On Thursday afternoon Valentine again had his Deperdussin out, this time taking his airing between the piers at Brighton, where the crowds on the front enjoyed a really splendid demonstration. At times he rose to a good height, and swooped down till the machine almost touched the water. Those who witnessed his return to the aerodrome will long remember the sight; flying low across the bridges, so that all might have a close view, he came to earth in splendid style at a speed of about 70 miles per hour.

Metzgar Bros. and Leno are working hard at their tests, which are proving very satisfactory. The new tractor biplane of Collyer and England has not been out yet, owing to a propeller bursting just after starting up for the initial flight.

Lanark Aerodrome.

WITH the introduction of a new 28-32-h.p. Anzani, the Lanark school has now been brought fully up to the requirements necessary for the R.Ae.C. tests.

Two fully qualified mechanics and constructors are employed in the school, and a large quantity of spares are being stocked to avoid any possible delay to pupils. Indeed, the equipment of the school together with the ideal ground is already proving itself by the number of new pupils joining.

On Thursday and Friday last week Messrs. Forson, Jackson and Warren were out rolling, and on Friday evening Warren was so far advanced as to venture a short flight, which proved quite successful. On Thursday, Friday and Saturday Mr. Ewen was flying on the Deperdussin, making wide sweeps over the surrounding country. On the Thursday evening Mr. Ewen carried out a half hour's cross-country flight, during which he passed over the falls of the Clyde.

Liverpool Aviation School, Sandheys Avenue, Waterloo.

WEDNESDAY, Sept. 6th, Mr. Jones was out, making straight line flights and practising glides from a height of 100 to 150 ft. He began by flying northward a mile and a half, then returned past the hangars, landing at Seaforth, a distance of nearly three miles, finally returning to the hangars, a distance of one mile.

Just before lunch on Thursday, Mr. Jones again flew northward as far as the River Alt and back, a distance of nearly five miles.

In a puffy wind, which decided him to suspend operations, he executed on Saturday a fine figure of 8.

On Monday he made a trip to Seaforth and back, covering about three miles, and next day succeeded in qualifying for the first and third tests of his certificate at a height of 300 ft., completing five figures of 8, and terminating in fine style with a *vol plané*, landing within 30 yards of the mark. The observers were Messrs. E. Birch and B. Bicket.

London Aerodrome, Collindale Avenue, Hendon.

Valkyrie School.—On Wednesday morning last week at 5.30 Ridley-Prentice on the school machine flew three circuits at an altitude of 250 ft. The school pilot gave passenger flights to Loraine, Chambers and Ridley-Prentice. With fuel tanks full the machine rose well with 12 st. passengers. Captain Loraine then took the machine over and did a lot of flying at an altitude ranging from 100 to 200 ft. At 8.0 a.m. Ridley-Prentice again ascended and made two flights, two circuits each, but found the air already very tricky, air pockets being very bad.

At 6.0 p.m. Mr. Barber ascended with Mr. Scott-Brown, who took up his kinematograph apparatus. A long flight over the surrounding country was made to Hendon, the Welsh Harp, and back *via* Mill Hill, and most interesting pictures should result. At the same time Mr. Ridley-Prentice made an excellent flight of five circuits on the school machine, eventually landing in front of the hangars with a perfect *vol plané* from 400 ft.

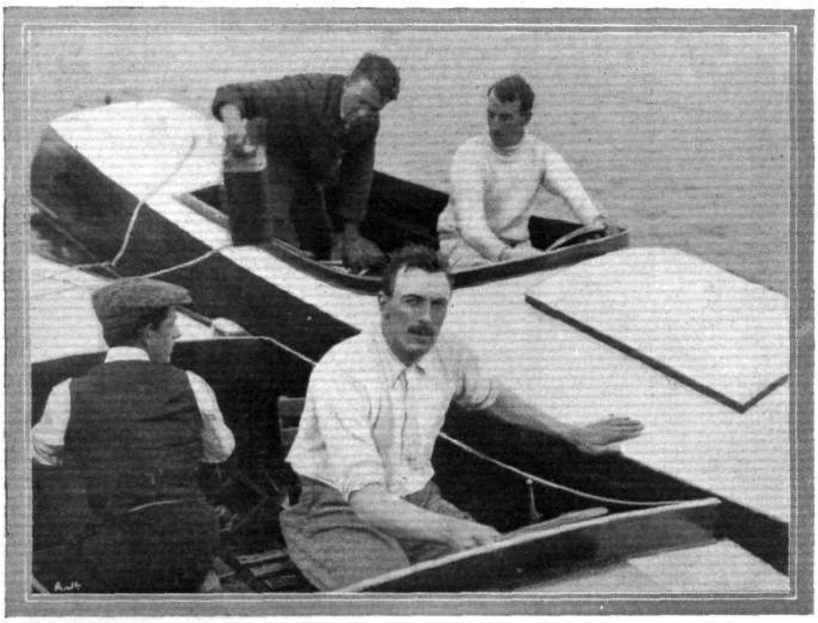
On the return of the passenger carrier, the pilot was kept busy with several passengers. Meantime, Captain Loraine put up some excellent circular trips on the Valkyrie Type A, his banking at the turns being very steady. Three Gnome-Blériots, a Farman, and a Valkyrie were in the air together, to say nothing of Anzani-Blériots. Captain Loraine considered the "traffic a little too much," nevertheless he has made wonderful progress. Chambers then made straight flights with success. Mr. Barber continued demonstration flights when not carrying passengers, and just before dark Mr. Ridley-Prentice put up a fine flight of 25 minutes duration. Numerous glides and sharp turns were included in the flight, and no little dexterity was required to keep clear of the many machines in the air at the time.

Miss Trehawke Davies on Thursday, with her usual enthusiasm, arrived at 5.30 a.m. for a lengthy flight, but fog caused delay until 7.15 a.m. Then Mr. Barber ascended with Miss Davies and accomplished a 30-min. flight at an altitude of 700 ft. terminating with a magnificent spiral *vol plané*.

Mr. Barber, at 5.30 p.m., was out on the passenger carrier taking up numerous friends. Ridley-Prentice was at work with the school machine, making eight circuits at a height of 800 ft. and practising numerous glides, whilst Capt. Loraine was also practising numerous figures of eight at heights ranging from 200 to 300 ft.

At 6 a.m. on Friday Capt. Loraine was again tackling figures of eight with great success, and he should secure his *brevet* at any time now. Chambers put in good work and accomplished steady circular flights. Mr. Barber carried a lady passenger across country in the direction of Harrow and back again over Hendon water and the Welsh Harp, after which he ascended for a solo flight to a great height, descending *en vol plané*.

Capt. Loraine, after making numerous figures of eight, had to descend on account of a brisk breeze arising, otherwise he would have made the necessary flights for his *brevet*. In the evening Mr.



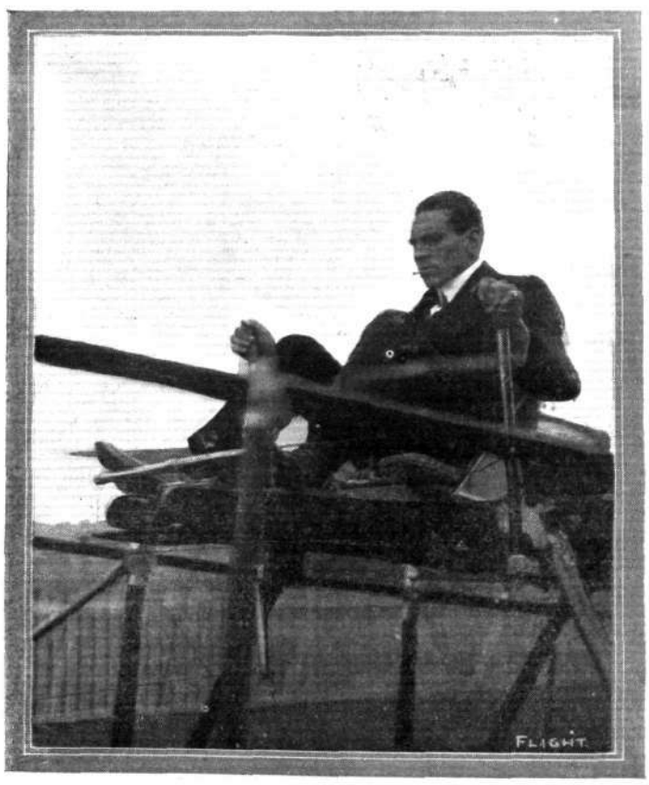
Mr. Valentine, whose name has been so prominently associated with flying, and who was the third man to complete the recent *Daily Mail* Circuit of Britain, has recently been indulging in motor boating, and our photograph shows him at the recent Lowestoft meeting of the British Motor Boat Club.

Barber ascended with a lady passenger and put up a very fine flight at a good height, whilst Ridley-Prentice was on the school machine flying until quite dark.

On Tuesday, September 12th, Ridley-Prentice tried the Gnome-engined Valkyrie racer for the first time, and after making several steady circuits of the aerodrome dipped the nose for a *vol plané* descent. Unfortunately he handled the switch too roughly, causing a "short," with the result that, contrary to his expectations, the engine continued to run, unfortunately resulting in a bad landing; Mr. Prentice was, however, thrown clear of the machine and sustained only slight injuries.

Salisbury Plain.

Bristol School.—The day's work on Monday of last week was started off with solo flights by Lieut. Newall and Mr. Pitman, both doing very neat circuits, after which Jullerot, Busteed and Pixton went on with tuition work. Capt. Watt made a very good solo round Fargo and Stonehenge, landing exceptionally well. In the evening conditions were rather tricky but not sufficiently so to impede tuition work, which went on very briskly, Jullerot carrying Lieut. Strover, Capt. Steele Hutcherson and Mr. Mellersh, Prier taking Mr. Lee. In addition to these pupils several gentlemen visiting the school were taken for flights, which apparently whetted their appetites for aviation. Lieut. Montifiore flew a good solo for quite 20 minutes. On Tuesday Prier again delighted everyone with a fine exhibition of speed, flying on his new monoplane, which seems to create a wave of enthusiasm whenever it appears. He landed safely on very rough ground at Fargo. Busteed took Mr. Lee, Capt. Steele Hutcherson, Lieut. Strover and several passengers, while Pixton, after taking pupils, flew with Ercole, Prier's mechanic, over to Fargo to start the engine of the monoplane again. The day's work was finished by Lieut. Stuart, Capt. Watt, Cadet Wheeler and Lieuts. Newall and Montifiore making solo flights. On Wednesday morning Jullerot made a trial and then Capt. Watt, Lieuts. Newall and Stuart were sent on No. 9 and Cadet Wheeler on the military machine for solo flights. Busteed did some weight carrying by taking Lieuts. Stuart and Newall for two circuits, the total weight being 34 stone. He then carried Mr. Lee, Lieut. Strover and Capt. Steele Hutcherson each for two flights. Jullerot invited a cavalry officer for a flight over the cavalry school, who subsequently declared himself badly bitten by aviation and decided to become a pupil of the school.



Mr. W. Ridley-Prentice, who is now taking active control in connection with the Aeronautical Syndicate at the Hendon London Aerodrome. Mr. Ridley Prentice is seen in the pilot's seat of the new Valkyrie racer.

Mr. E. F. Driver, one of the recent pilots who have secured their Royal Aero Club brevet at the Grahame-White School. His first cross-country flight was from Hendon to Windsor, which he reached after struggling against a strong wind for an hour and a half. He was accompanied by Capt. Vandeweyer as passenger.

The Air Battalion.—The officers have hardly settled down to normal work yet, but they are returning in ones and twos, as also are the machines, several of which are decidedly the worse for wear. Tuesday evening of last week was splendid for flying, and Capt. Fulton made several good trips. As Lieut. Barrington Kennett was expected fires were lighted to guide him, but he came not. On Wednesday Capt. Fulton and Lieut. Conner put in a good deal of scouting practice, mostly at a height of about 800 ft. Several more officers and twenty-seven men returned to camp from manœuvres during the day. Two more sheds to accommodate the Army machines are now being erected by Messrs. Harbrow, of Bermondsey. On Thursday Capt. Fulton and Lieut. Conner were again busy, and a few minutes after seven in the evening Lieut. Barrington Kennett arrived from Farnborough, at a good height, and landed by a spiral *vol plané*. On Friday two more machines arrived from Oxford and a good deal of work was put in by Capt. Fulton and Lieut. Barrington Kennett, in the evening these same officers with Lieut. Conner and Lieut. Reynolds again flying. A great amount of work was put in on Saturday morning repairing the various machines in the hangars, while outdoor work consisted of flying by Capt. Fulton, Lieut. Barrington Kennett and Lieut. Conner, all three again flying on Sunday morning, Lieut. Conner carrying a passenger. On Monday they were practising in view of some despatch-carrying and bomb-dropping experiments which will shortly be carried out.

Southport Aerodrome.

IN the few days last week that the Hon. W. S. Leveson-Gower, R.N., was over, he made rapid progress in handling the small biplane built by Mr. Gaunt, in all making twelve flights, several being of over half a mile each. The wind prevailing was N.W., consequently the course was restricted by the tide, or longer flights would have resulted, as Mr. Gower showed plenty of confidence and made good landings. He is a good five stone heavier than Mr. Gaunt, but the extra weight appeared to make no difference to the 30-h.p. Alvaston.

BRITISH NOTES OF THE WEEK.

A Ray of Hope for Great Britain.

THOSE people who have practically abandoned hope of seeing the British Government give adequate attention to the question of aeronautics, may take heart of grace at the announcement that the War Office has decided to send an expert to witness the official tests of military aeroplanes which commence in France on October 1st.

Mr. Cody and the Michelin Cup No. 2.

AT his third attempt on Monday last, Mr. Cody succeeded in getting round the 125-mile circuit from Laffan's Plain to Andover, Hendon, Brooklands, and so back to Laffan's Plain. His time was 3 hrs. 7 mins., and he now stands first in the competition for the British Empire Michelin Cup No. 2, which closes on October 15th.

Flying Across the Bristol Channel.

ON concluding his engagement at Weston-super-Mare, Mr. B. C. Hucks mounted his Blackburn monoplane and flew across to Cardiff, where he had arranged to give some exhibitions. He landed on the Whitchurch Polo Ground at one minute past six a.m., giving the good people of Cardiff an early *réveille*. His time for the distance of about 16 miles was 16½ minutes.

Last Saturday he made three very good flights at Weston, and he intended to cross to Cardiff in the evening but in descending at the end of the third try one of the planes hit a tree and was slightly damaged.

England's Youngest Aviator.

THERE appears to be keen competition as to who shall be the Benjamin of British aviators, and the position at present appears to be held by Naval Cadet R. F. Wheeler, who passed tests necessary to qualify at the Bristol School on Salisbury Plain on Saturday last. He is, however, a little older than Naval Cadet Robinson, who is learning at the Deperdussin School at Brooklands, but the latter has not yet accomplished similar tests. Cadet Wheeler, after leaving the training college, joined the Bristol School on August 8th, and learnt to fly in four weeks, making the test flights five days after making his first solo flight.

The Naval Valkyrie Machines.

IT should not be long now before the naval officers commence work with the two Valkyrie machines presented to the Navy by Mr. Barber, as we learn that the Admiralty are transferring them to Eastchurch on Monday. In the meantime a new Gnome-engined military type Valkyrie is off the stocks and great things are expected.

Dirigible Voyage Over the Midlands.

BY way of a trial trip, preparatory to the running of a regular series of passenger voyages, Mr. E. T. Willows steered a dirigible made by Messrs. Willows, Ltd., from Birmingham to Leicester on the 7th inst. There were four passengers besides Mr. Willows on board.

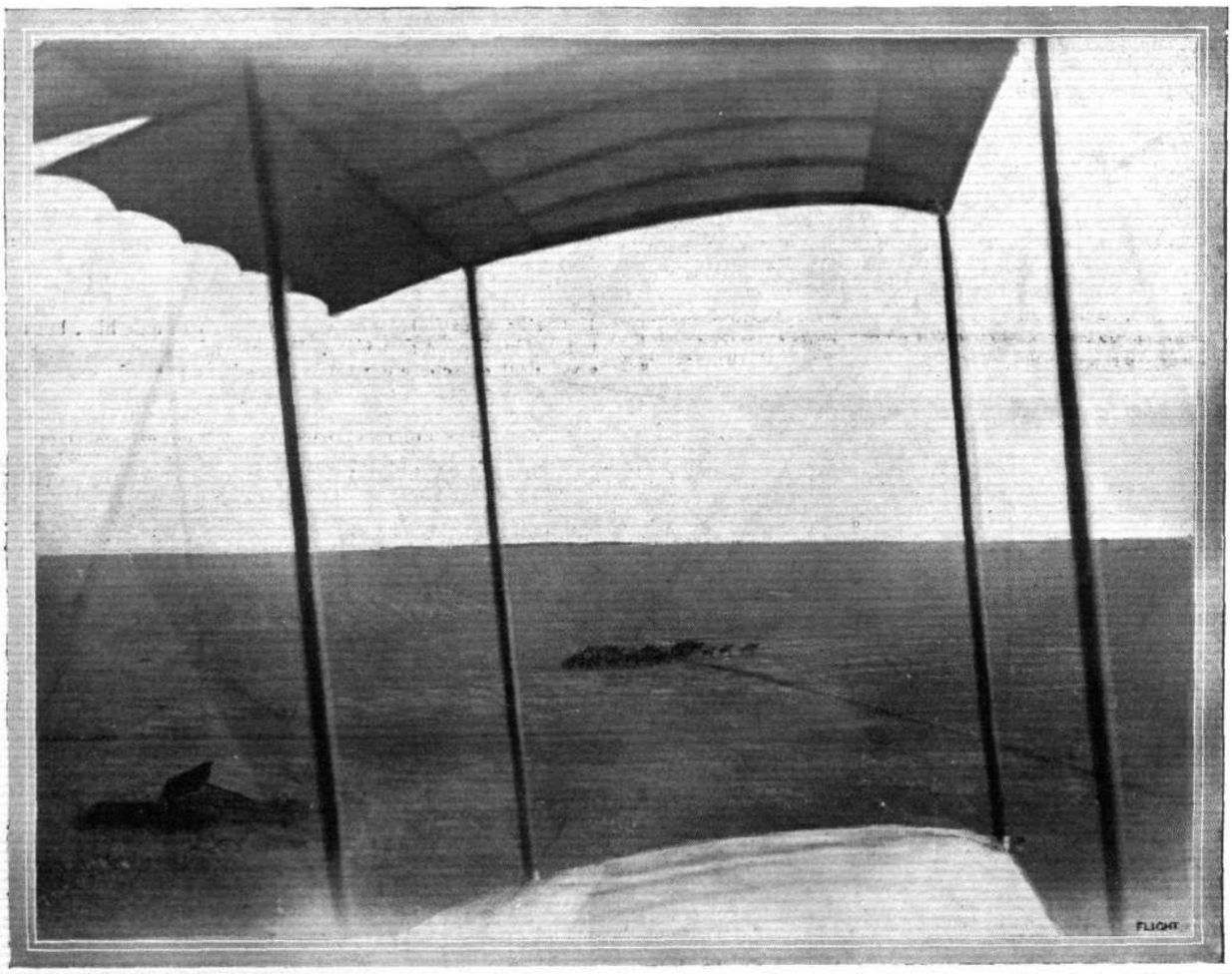
Our Poor Naval Airship.

IN spite of hopes that the Naval airship might have been given another airing, she is still kept most religiously inside the shed at Barrow, and rumour has it that, as a result of a visit of the Advisory Committee on Aeronautics, the great envelope of the airship will be cut in half and considerably lengthened in order that she may carry more weight. Apparently she is not quite capable of lifting the 20 tons for which she was designed, and either the buoyancy will have to be increased or the weight will have to be cut down.

"Gamma" Visits Guildford.

THE Army airship "Gamma," with a crew of six, including Capt. Broke-Smith, Capt. Maitland, and Mr. Mervyn O'Gorman, made a prolonged flight on Tuesday morning last, circling Guildford and returning to Farnborough by way of Farnham, Crondall, and the Long Valley.

The flight lasted 1½ hours, and the distance covered was 40 miles.



AEROPLANES AND THE BRITISH ARMY.—Another photograph secured from Lieut. Barrington Kennett's biplane last week at Salisbury Plain in the early morning. In this some of the cavalry will be seen in the centre of the picture, and, away beyond on the horizon, the regiment is seen in full strength stretching across the plain.

FLIGHT

A COLONIAL OFFICER TAKES HIS BREVET.

ABOUT a fortnight ago Captain Walter Oswald Watt, of the New South Wales Scottish Rifles, very successfully passed his tests for the Royal Aero Club pilot's certificate (No. 112) at Salisbury Plain. Captain Watt is the keenest of patriots and is the first Australian military officer to obtain a certificate, and probably the first overseas Colonial officer to fly, including Canada and South Africa. Captain Watt proved himself an extremely apt pupil at the Salisbury Plain Bristol school, where he was initiated into the art of flying by MM. Jullerot and Tetard, occupying from first to last just three weeks for the obtaining of his certificate. After he had had only three passenger flights he made a solo trip at the first attempt, and he speaks very highly of the methods adopted by the Bristol school. The obtaining of this *brevet* should be an opportunity for Australia to supplement the very comprehensive military programme which has recently been started there, comprising a huge scheme of compulsory training and the building of a Navy. They are evidently bent upon keeping up their own prestige and that of the Mother Country, and no more up-to-date methods could be suggested to them than the starting of an Air

Captain W. O. Watt, the first Colonial Officer to take R.Ae.C. brevet rank. He is a pupil of the Bristol School.

Corps now that they have obtained a competent aviator of their own to take the matter in hand. We shall hope to see a move being made in this direction, and possibly then in case of sudden and serious trouble, the Mother Country may be able to borrow a detachment of Australian military aviators to make up for the dearth of home pilots, the complete discouragement of whom appears at present to be the main pleasure of the British War Office.

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Hélen Beats His Own Record.

NOT satisfied with his previous record of 1,126 kiloms. for the Michelin Cup, Hélen, on Friday of last week, made a successful attempt to better this and incidentally to make his position for the Quentin-Bauchart prize, for which this cross-country flying also counts, more secure. On a 50-h.p. Gnome-engined two-seated Nieuport he covered over twelve laps of a course from l'Humery, just by Etampes, to Gidy, near Orleans, giving a score of 1,200 kiloms. for the Michelin Cup, while the total distance covered was 1,252·8 kiloms. in 14 hrs. 7 mins. 50 secs. He started at ten minutes to five in the morning and covered four laps before stopping for 17 minutes. Four more laps were covered and then another stop of 17 mins. 44 secs. was made. Then after another two rounds a quarter of an hour's rest was indulged in before flying the last two rounds.

AIR EDDIES.

PROBABLY no aviation pupil has been so short a time in progressing from the hopping stage to the star turn stage as has M. Salmet, at Hendon. Moreover, it is not surprising when one takes into consideration the thoroughness with which all his doings, at least in connection with aviation, have been characterised in the past. At the Blériot school, where he graduated, he served in the double *rôle* of mechanic and pupil, and so not only has he become a surprisingly good pilot, but it is doubtful if even Blériot's own mechanics understand the ins and outs of the monoplane's construction better than does Salmet himself.

Here we see him turning out last Saturday—the Aerial Mail day at Hendon—and flying in a wind that, to put it colloquially, would have given many aviators of twice his experience "cold feet."

He resembles no one so much as Vedrines in his initiative and skill, and I have every confidence in forecasting for him as much success as has been earned by that latter pilot.

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The Blériot school at Hendon, although they do not turn out as many pilots as other English schools I could mention, can boast of the fact that most of their pupils "make good" after they have finished their course of tuition.

Besides Salmet, there are Weir and Ewen up in Scotland, and Champion out in California, all old pupils at the Blériot school.

Champion's latest scheme is to earn dollars at the rate of one hundred a minute by a 6-minute flight over his native town.

Their latest certificate winner is Abercromby, or "Aber," as he is affectionately known to his friends. Should he continue flying he should put up some good performances, as he signified the completion of his tuition by flying for his certificate in a twenty mile an hour wind.

• • •

It is rather interesting to note that "Tommy" Sopwith has acquired a Wright biplane, and it was on this machine that he carried off the quick-starting prize, and ran second in the bomb-dropping competition at the Boston meet. Perhaps this is Sopwith's method for appeasing the Wrights, whose wrath he undoubtedly raised by winning many prizes with a machine that infringed their patents.

• • •

I hear a rumour from Brooklands that one of our well-known constructors will shortly make an appearance with a machine that is in effect a combined monoplane and biplane. The wings will be so constructed that they can be interchanged in a few minutes, so allowing the machine to be converted from one type to another. The test of this new machine will be awaited with interest, for as far as can be remembered this is the first time that the advantages of such an aeroplane have been put to practical test.

• • •

Although Grahame-White was undoubtedly the "star turn" at the Boston meet he did not make so much money in prize winning as did Sopwith, for the former only won $5,224 whereas Sopwith cleared $6,022. However, these figures are scarcely a criterion of what Grahame-White actually brought away with him, for I have it on pretty good authority that he was "guaranteed" to the extent of something like $10,000.

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Taking advantage of the full moon and ideal weather conditions, Raynham made several moonlight flights at Brooklands last Monday night, taking up different passengers in succession.

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A funny incident occurred while Grahame-White was sitting for his portrait to that well-known portrayer of motoring subjects, Guy Lipscombe. The artist had got him, as he thought, nicely settled on his "throne."

But "Claude" was by no means comfortable, for after a period of fidgetting, he stood up suddenly with the exclamation "Gad! Lipscombe, are you sure it's safe up here?"

This from one who exhibits not the slightest apprehension in venturing out on a Farman in a 40 mile-an-hour gale.

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Some of our aero-mechanics, especially those that have graduated from carpentering to their present position, often get weird notions into their heads as to the advantages that certain constructional features possess. One well-known character, who shall be nameless, was fearfully "hot" on the idea that, were it not for the "bat-wing" method of finishing off the trailing edges of Farman planes, these machines would not be able to leave the ground.

On another occasion being very talkative by reason of—well, anyway he was very merrie and bright—he made the somewhat original assertion that there was nothing new about the Gnome engine as he had fitted them to torpedoes fifteen years before.

"OISEAU BLEU."

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 12th inst., when there were present :—Mr. R. W. Wallace, K.C., in the Chair, Mr. Ernest C. Bucknall, Col. J. E. Capper, C.B., R.E., Col. H. C. L. Holden, C.B., R.A., F.R.S., Prof. A. K. Huntington, Mr. F. K. McClean, Mr. Mervyn O'Gorman, and Harold E. Perrin, Secretary.

New Members.—The following new Members were elected :—Evelyn Frederick Driver, Cecil Compton Paterson, William Schubach.

Aviators' Certificates.—The following aviators' certificates were granted :—

128. H. A. Petre (Hanriot).
129. Wm. E. Gibson (Bristol Biplane).
130. E. W. C. Perry (Valkyrie).
131. Eric Harrison (Bristol Biplane).
132. S. P. Cockerell (Bristol Biplane).
133. R. O. Crawshay (Blériot).
134. R. O. Abercromby (Blériot).
135. Lieut. G. J. E. Manisty (Hanriot).

Records.—The committee accepted the following records :—

Speed.—Gustav Hamel (Blériot) at Eastchurch, on July 1st, 1911, closed circuit, six kilometres, time 2 mins. 45⅘ secs., equals 130·43 kilometres per hour, equals 81·04 miles per hour.

Application will be made to the Fédération Aéronautique Internationale for its acceptance as a world's record for speed.

Speed Over Given Distance.—At Eastchurch, Isle of Sheppey, on July 1st, 1911 :—

		h.	m.	s.		
5 kiloms.	...	0	2	18	...	Gustav Hamel (Blériot).
10 ,,	...	0	4	41⅘	...	C. T. Weymann (Nieuport).
20 ,,	...	0	9	23⅕	...	Do.
30 ,,	...	0	14	7⅖	...	Do.
40 ,,	...	0	18	51⅘	...	Do.
50 ,,	...	0	23	36⅘	...	Do.
100 ,,	...	0	47	38	...	Do.
150 ,,	...	1	11	36⅕	...	Do.

Application will be made to the Fédération Aéronautique Internationale for the acceptance of these as world's records.

British Record.—*Distance, Aviator and Passenger.*—Lieut. E. L. Gerrard, R.M.L.I., at Eastchurch on August 16th, 1911, on Short biplane, accompanied by Lieut. Wildman-Lushington, R.M.A., 129 miles.

Aviators' Certificates.—The question of raising the standard of efficiency for aviators' certificates was considered. The Committee were of opinion that there should be two certificates, the higher certificate to include tests, such as cross-country flights, duration, altitude, gliding, passenger flights, &c. The question will be further considered, and in the meantime the Committee will welcome any suggestions on the subject.

British Empire Michelin Cup (No 2).

Mr. S. F. Cody on the Cody Biplane made a flight in connection with the above competition on Monday, the 11th inst. Starting from Laffan's Plain at 5.39 a.m. he passed over Andover, Reading, Hendon, Brooklands, and returned to Laffan's Plain at 8.45½ a.m. The distance covered was approximately 125 miles.

This is the first recorded flight in the competition which, for this year, closes on October 15th next.

Certificate of a Two-hours' Non-stop Run of an E.N.V. 8 cylinder Motor, Wednesday, August 2nd, 1911.

Conditions.—The engine was fixed on a test bench and a Walker dynamometer was attached to the crank-shaft, the plates employed being 8½ in. × 17 in. and the radii 11 in. The engine was cooled by water from a tank circulating through the jackets, pump, and radiator, and back to the tank.

The fuel (Shell spirit) was gravity fed.

The oil (Price's Motorine C) was gravity fed from a tank to the crank-chamber, and thence circulated by the oil pump.

No part of the engine, or its control levers, were touched during the trial, except the regulation of the throttle during the first two minutes.

Period.—The engine was started at 4h. 4m. 10s., running at 1,130 revolutions per minute.

At 4h. 6m. 20s. the throttle was shut down to give 1,120 r.p.m.

At 4h. 32m. 35s. the revs. stood at 1,140 r.p.m., which speed remained constant throughout the remainder of the run.

At 6h. 4m. 10s. the throttle was shut down, the engine having been run for two hours.

At 6h. 5m. 0s. it was opened and the speed accelerated to 1,200 r.p.m., the engine running at this speed till 6h. 6m. 50s., when the run was brought to a finish at the observer's request.

Performance.—By the power chart of the Walker dynamometer it is shown that the engine developed over 60-h.p. throughout the two hours' non-stop run, the actual b.h.p.'s being as follows :—

At 1,140 r.p.m., 64·3-b.h.p. At 1,200 r.p.m., 75·2 b.h.p.

Remarks.—The engine ran very satisfactorily throughout the test.

A. K. HUNTINGTON, Technical Committee.
H. WAYMOUTH PRANCE, Observer on behalf of the Royal Aero Club.
HAROLD E. PERRIN, Secretary.

Late Hon. C. S. Rolls and Cecil Grace.

Several residents at Eastchurch have expressed the wish to place a stained glass window in the Church at Eastchurch, in memory of the late Hon. C. S. Rolls and Cecil Grace, both of whom made their first experiments in flying in the district.

The following amounts have so far been contributed :—Collected at Eastchurch, £12; Hon. M. Egerton, £5; F. K. McClean, £5; W. J., 10s.; H. P., 10s.; F. S., 5s.; James W. Grace, £5; J. Armstrong Drexel, £1; P. R. Grace, £5; C. A. Grace, £5; Harry Turrill, 10s. 6d.; C. R. Grace, £5; F. Hedges Butler, £1 1s.; J. W. Dunne, £2 10s.; Miss Dunne, £2 10s.; Col J. E. Capper, C. B., R.E., £1 1s.; Albert G. Leeper, 10s.; total, £52 7s. 6d. Members wishing to contribute are requested to communicate with the secretary of the Royal Aero Club.

HAROLD E. PERRIN,
166, Piccadilly. Secretary.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

Birmingham Aero Club (62, ALBION STREET).

THE attention of model flyers in the Midlands is directed to the competition for the "Championship of the Midlands (1911)" to be held at the club's ground, Billesley Farm, Yardley Wood Road, King's Heath, on Saturday afternoon, Sept. 30th. Two handsome gold centre silver medals have been presented to the club, the one for the winner of the senior championship, the other for the junior. In view of the rather startling records lately reported by model flyers the times made in this competition should be interesting.

A good programme for the future of the club is now being arranged, and the Committee appeal for the co-operation of all interested in aviation in the district. The terms of membership enable anyone to come forward and give a hand in fashioning the destinies of the club, and help to carry it to the position which it deserves. A club aeroplane and permanent aerodrome at Billesley Farm is now being actively engineered.

Blackheath Aero Club (5, LIMESFORD ROAD, NUNHEAD, S.E.).

THE second meeting was held during the week-end, when members turned up in full force and had some excellent flying, in spite of a very gusty wind.

Fine flights were made by Messrs. Dolittle, Hunt, Rippon, and Clark, the latter having the doubtful pleasure of watching his "A.B.C." monoplane fly right across the heath and finish its flight in Greenwich Park—where it still remains.

The display of night flying was a great success and attracted a big crowd. Several new members were enrolled. The next meeting will be held to-day, Saturday, at the usual place at 4 p.m., when a steering competition will take place. There will also be a rising from ground competition on Saturday, September 23rd, at 4 o'clock. On the above dates, and also Thursday, September 21st, at 7.45 p.m., members will give further exhibitions of illuminated model flying.

Coventry Aeroplane Building Society (22, KINGSTON ROAD).

A VERY interesting model flying meeting was held on Saturday last in a field at Birmingham Road, lent by Mr. Fletcher. Although a fairly strong wind was blowing all the afternoon, there was some excellent flying, Mr. Shorter winning the day with a flight of 350 yds., his small 1½-oz. model also putting up a splendid flight of 230 yds. at an altitude of about 50 ft. Great interest was taken in Mr. T. Cobb's new racing monoplane. This model develops a wonderful turn of speed, but will persist in flying in circles. Mr. J. E. Overton's "Overton" monoplane made a hurried descent, caused by the left-hand propeller winding up a bracing wire; but the owner had some good flights with his new racing monoplane. Some excellent tree climbing was witnessed in vain attempts to rescue Mr. L. Riley's model from the clutches of a large oak tree. Mr. A. Austin was out for altitude, his model several times climbing to between 80 and 90 ft., while covering a distance of 150 yds. Mr. A Rice's large surfaced model being under-powered would not fly a long distance, but proved to be very stable. Another meeting has been arranged for to-day, Saturday, a prize being offered for the best flight of the afternoon. Entrance fee, 2*d.* each model.

The club has been trying to arrange an exhibition of flying by Mr. H. Barker on a Valkyrie monoplane, but owing to the impossibility of obtaining guarantees to cover the expenses, the idea has been dropped for this year, but it is hoped to revive it next spring.

Kite and Model Aeroplane Assoc. (27, VICTORY RD., WIMBLEDON)

THE next open kite-flying competition will be held on Wimbledon Common, on Saturday, Sept. 30th, at 3 o'clock. 1st prize, BrooKite, value 30*s.*; 2nd, BrooKite, value 25*s.*; 3rd, BrooKite, value 15*s.* Entries close Sept. 23rd. Free to members; non-members, 1*s.*

Rules.—1. Competitors may submit any kite, either home-made or manufactured.

2. Competitors must be at the judges' flag at 2.30 sharp. Any competitor not present at that time will be disqualified.

3. The competitors must have exactly 300 yards of line on winders, and the line or wire may be of any size or kind.

4. The judges will take the angle of kites when in flight.

5. Competitors must note that the competition will last 40 minutes, and if the kite falls to the ground during that time it will be disqualified.

6. Marks will be awarded for angle, stability, strength of construction and collapsibility. Maximum of marks is 40, 10 for each test.

The Councillors of the Association will if possible give a display of kite flying, and also endeavour to establish an altitude record if the weather is suitable.

Liverpool Model Aero Club (39, BROOK ROAD, BOOTLE).

A MEETING was held last Saturday at the club ground when seven members competed for Mr. Harrison's prize. Owing to the strong wind the distances were not good, the winning flight of the day being 300 ft. by H. D. Davis, with his twin screw racer. W. S. Ledward, second, A. G. Pugh, third. There will be a flying meeting at 3 o'clock to-day, Saturday. Meeting place, 39, Brook Road. Committee meeting on Friday, September 22nd, and flying on the 23rd. Will all members make a point of being present on both occasions.

Manchester Model AeC. (BROWNSFIELD MILLS, MANCHESTER).

ON Saturday last a cross-country model competition took place and was very well attended, some of the models covered the length of the Aerodrome in about a dozen flights. There is to be another meeting on Saturday, Sept. 23rd at 2.30, and all those who are interested are invited to be present. The club year will commence Oct. 1st, and subscriptions now being collected will run from that date. Further information will be supplied on application to the secretary.

FOREIGN AVIATION NEWS.

Other Competitors for the Coupe Michelin.

ON the 5th inst. Tabuteau on his Morane monoplane had a try for the Coupe Michelin but had to abandon after 400 kiloms. On Friday of last week on a course from Courcy to Somer-Vesle, Marcel Prevost on his Deperdussin put up a very fine try, but unfortunately in jumping out of his machine after covering 835·8 kiloms. he sprained his left hand so badly that it was impossible for him to continue. He however, as soon as he is able, intends to have another try. At Etampes on the same day Pascal started to make another attempt but abandoned after 100 kiloms.

The Quentin Bauchart Prize.

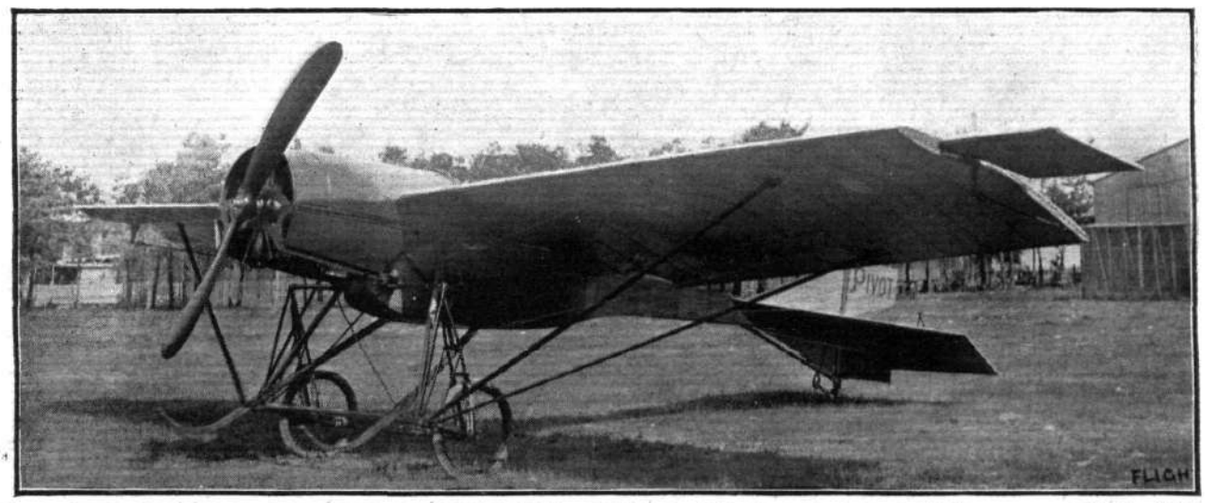
BY his second flight for the Michelin Cup Hélen has placed himself in a very strong position for the £2,000 prize offered by the Municipal Council of Paris. He leads with a record of over 2,700 kiloms., the nearest to him being Vedrines with 1,908 kiloms. Renaux has also been piling up a good record, now exceeding 1,500 kiloms, and gets a bonus of 25 per cent. on his mileage for carrying a passenger. Gibert stands fourth with 1,123 kiloms., Tabuteau fifth with 930 kiloms., and Garros sixth with 845 kiloms.

Mdlle. Dutrieu and the Coupe Femina.

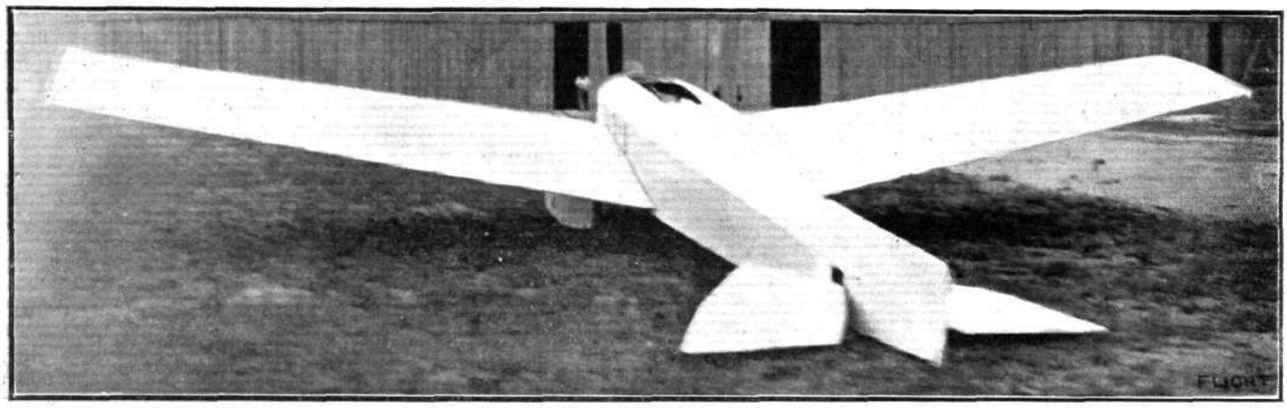
ON Monday at Mourmelon, using one of the Henry Farman racing machines, Mdlle. Dutrieu tried to regain the Coupe Femina, for which Mme. Herveu at present holds first place. After 150 kiloms., however, the motor proved refractory, and Mdlle. Dutrieu was forced to land.

Mdlle. Dutrieu Beats Mme. Herveu.

AT her second attempt on Tuesday last Mdlle. Dutrieu was more successful. Starting at three minutes to five in the morning, she remained aloft for 2¾ hours, covering the 10 kilom. course at



THE NEW MILITARY PIVOT MONOPLANE.—The span of this machine is 10·5 metres and the lifting surface is 16 square metres, while the weight is given as 310 kilogs. It will be seen that the use of wire stays has been entirely abandoned in favour of steel tubes. Natural stability is adjusted by the two ailerons at the tips of the main plane, and the rudders and elevators at the rear being controlled by a wheel. The motor fitted is a 45-h.p. Rossel Peugeot.



LATHAM'S ANTOINETTE FOR THE MILITARY COMPETITION.—General view from the rear of this new machine which embodies a good many departures from previous Antoinette practice. The body is entirely enclosed, as also is the 100-h.p. Antoinette engine. The body has been so designed that the pilot has a complete range of vision, windows in the floor enabling him to see beneath him. The span of the machine is given as 15·9 metres, and the surface 56 sq. metres. The overall length is about 11½ metres. The chord of the main planes is 4 metres at the junction with the fuselage, and decreases to 3 metres at the tip. The machine in flying order weighs 1,250 kilogs.

Chalons 23 times. The altitude varied between 70 and 100 metres. This flight completely put in the shade Mdme. Herveu's 101·6 kiloms., and Mdlle. Dutrieu thus stands first for the Coupe Femina with 230 kiloms.

Bordeaux-Paris-Bordeaux Race Postponed.

As the result of representations from the manufacturers, who explain that they are too busily engaged with the military aeroplane competition, the Aero Club of France has decided to postpone its race from Bordeaux to Paris and back, which was to have started on October 5th, till next year.

The New Michelin Prize.

AFTER a long discussion regarding the new target prize offered by Michelin et Cie., the Aviation Committee of the Aero Club of France have decided that owing to the difficulties of the problem the drawing up of the regulations shall be referred to a committee consisting of M. R. Soreau, Lieut. Col. Bouttieaux, MM. Blériot, Esnault-Pelterie, Commandant Ferrus, Count Lambert, MM. A. Michelin, Tissandier, and a delegate representing the Minister of War.

Voisin Canards for Russia.

FOLLOWING on a visit by some Russian military and naval officers to the Voisin works, an order has now been placed by the Russian Government for several machines of the Voisin Canard type, arranged for use either on land or water.

Quick Climbing on a Deperdussin.

TESTING a military Deperdussin monoplane on the 5th inst., Prevost was flying at Betheny for an hour and a quarter. He afterwards went for an altitude test and in seven minutes rose 500 metres and re-descended.

Progress with the Astra Triplane.

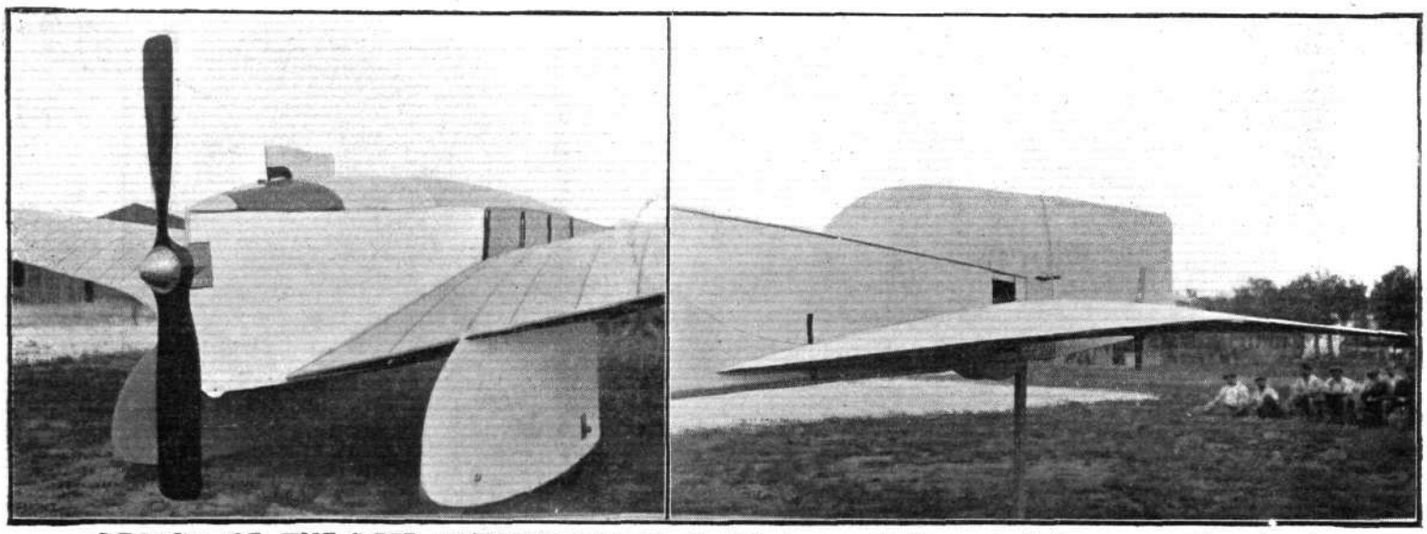
GOFFIN, who is conducting the trials of the new Astra triplane at Issy, is making good progress, and on the 6th inst. flew round the grounds several times at a height of 10 metres. Similar flights were also made on the 8th inst. Several good tests have also been made with the new biplane.

A Voisin Military Pilot.

AT the Voisin School at Mourmelon on the 8th inst. Lieut. Joly on a military Voisin biplane passed the first test for his superior military *brevet* by flying over a course which included Rheims, Neufchatel and Amifontaine. He covered the distance of 130 kiloms. in an hour and a quarter and his altitude was over 1,500 metres all the time.

The First Hanriot Aviatress.

ON the 9th inst., Mme. de Rick, who has been learning to fly at the Hanriot School at Rheims, successfully made the test flights for her *brevet*, and so becomes the first certificated lady pilot of this type of machine.



DETAILS OF THE NEW ANTOINETTE.—On the left is seen the fore part of the new machine, showing the way in which the landing chassis is fitted under the wings and is enclosed. This also indicates the location of the 100-h.p. Antoinette engine inside the boat-shaped body and also the shape of the main planes, the trussing of which is all arranged internally. The landing skids are 3·25 metres long, and each one is fitted with four wheels, two at each end. The view on the right shows the arrangement of the tail and the way in which the fixed plane can be adjusted, while the two landing wheels are also observable.

A Heavy Load for a Voisin.

WHILE testing a biplane of the military type, but built specially to the order of M. Michel Mahieu, the machine was taken to a height of 300 metres in less than five minutes, with a useful load of 275 kilogs. This, it is claimed, is a record in weight lifting.

A Long Tour in France.

LEAVING the Blériot school at Etampes at ten minutes past four in the morning of the 5th inst., Carles flew on to St. Nazaire, where he arrived about half-past twelve. He had made stops at Mans and Angers, but during a little over eight hours had covered about 400 kiloms.

Long Flying by Brindejonc.

STARTING from Monflanquin on his Morane monoplane on the 5th inst., Brindèjonc des Moulinais flew over to St. Gaudins, having covered 250 kiloms. in 2 hrs. 17 mins. On the following day he went on to Foix, and his time for the 90 kiloms. was 52 minutes, while he had to rise to a height of 2,000 metres to get over the Pyrenees.

The Belgian Army and Aviation.

APPARENTLY the officers of the Belgian Army are determined to do their best with the inadequate material at their disposal. At the Brasschaet Military Flying School there is a single Henry Farman machine, but in less than three months no fewer than eight officers have been trained on it.

Germany's First Lady Pilot.

THE number of lady aviators is gradually mounting up, and we learn that Germany now has a certificated aviatress, Fraulein Nelly Beese having made the tests to qualify for her certificate on the 8th inst., at Johannisthal.

The Kaiser's Chauffeur Turns Aviator.

WHETHER the German Emperor will ever follow his brother's example and trust himself in an aeroplane is a moot point, but it is interesting to note that his chief chauffeur, Hans Krieger, on the 5th inst. made the qualifying tests for his *brevet* on a monoplane of his own design and construction at Johannisthal.

Three German Fatalities.

LAST week was an unfortunate one for aviators in Germany, three well-known pilots meeting with fatal accidents. The first occurred on the 7th inst. near Bilzheim in Upper Alsace. In the morning Lieut. Neumann left the Habsheim aerodrome to fly to Strasburg, accompanied by Leconte, an instructor of the Aviatik firm, both men being certificated pilots. Apparently when near Heiligkrenz the motor stopped, and in planing down Lieut. Neumann made a too sudden turn to avoid some trees, with the result that the machine capsized and both flyers were killed by being crushed by the machine.

The third fatality took place near Stuttgart on Saturday evening, when against all advice Eyring, who only a few days previously had flown before the Kaiser at the Tempelhof, would insist upon going up. In starting, his machine hit a post and sustained some damage, of which the pilot was unaware. After a short flight, during which it was evident the machine was not right, the pilot in trying to clear some trees put the rudder over, and instead of responding the machine fell backwards. Eyring was thrown out and sustained a fractured skull.

The German Army Manœuvres.

AT the German Army manœuvres carried out in Mecklenburg Strelitz at the beginning of the week three dirigibles of the Gross type and four aeroplanes took part. Good work was done by these for both the Red and Blue Armies, the despatches being attached to small parachutes and dropped to earth.

Fatal Accident in Spain.

WHILE flying at the meeting at Huelva, in Spain, on Tuesday of last week, M. Laforestier, a well-known pilot of monoplanes, was killed through a fall. He went up in a strong wind, and, after flying about a quarter of a mile, the machine suddenly dived from a height of 60 metres, and in the crash it caught fire, burning the unfortunate aviator to death.

Military Aviation in Holland.

THE Dutch Government is now turning its attention to aviation from a military point of view, and Lieut. Poorten has just qualified at the Brouekere School for an aviator's certificate. It is expected that he will shortly be appointed by the Government to start an aviation school in connection with the Dutch Army.

A Russian Aviatress.

RUSSIA has now an aviatress in Princess Helene Schakowski, who has made the necessary qualifying flights to obtain her certificate.

New Russian Records.

ON his Gnome-engined Blériot, on Saturday last, the Russian flyer, Andriadi, successfully beat the Russian height and duration records, his altitudes being 1,260 metres and the duration of his flight 2 hrs. 2 mins.

More Aeroplanes for the Russian Army.

THE Russian military authorities are evidently not going to be left behind as regards military aviation, the latest announcement being that nine more aeroplanes are to be purchased from abroad.

Flying in Morocco.

BREGI with a Breguet biplane has arrived at Casablanca where he is to be at the disposal of General Bonnier. He is shortly to carry out a flight with two passengers from Casablanca to Tangier *via* Rabat, Mequinez, and Fez.

The £10,000 Trans-American Prize.

ON Monday morning Mr. Robert Fowler made a start on a Wright biplane from San Francisco on his flight across America for the £10,000 prize offered by Mr. Hearst. He made very good progress and reached Auburn, 129 miles from his jumping off point. On Tuesday he set off again to cross the Sierra Nevada with Reno as his objecture, but for some at present unexplained reason the machine fell near Alta, fortunately without injuring the pilot. He hoped to be able to start again on Friday.

On Wednesday, Mr. James J. Ward, on a Curtiss biplane, started off from New York to fly across to the Pacific coast.

Flying at Buenos Ayres.

THE large crowd which gathered for the important horse-race meeting at Buenos Ayres on Saturday last were able also to witness some flying, as Cattaneo on his Blériot flew over and landed on the racecourse. Paillette was also going to fly to the meeting, but while over the Rio de la Plata his machine was caught by the wind and fell into the water. Both the aviator and the machine were little the worse for the experience.

M. Roland Garros, who last week put up a new altitude record on a Blériot monoplane of 13,943 feet at Parame, near St. Malo.

AVIATION AT THE FRENCH ARMY MANŒUVRES AT VESOUL.—Amongst those who are making history in connection with the French Manœuvres now in progress, three important men are seen above, viz., Capt. Felix (on right), the Director-in-Chief of the Aeronautical Section of the manœuvres, and Sappers Martinet and Legagneux.

At the French Military Manœuvres.

IT is impossible to give in the limited space at our disposal a full account of the doings of the French aviators at the military manœuvres which have been carried out in the East of France, as each day there has been an enormous amount of flying, both by officers and civilian aviators. Nineteen flyers, under Capt. Eteve, including, among the reservists, Latham, Fourny, Nieuport, Renaux, Hélen, Sommer, &c., were attached to the 6th Corps; while twenty-five, under Capt. Felix, have been attached to the 7th Army Corps, the reservists including Martinet, Legagneux, Loridan, Tabuteau, and Vedrines. Moineau, a pilot at the Breguet School, was also among those attached to the 7th Corps, and on Tuesday of last week on a Breguet with a 100-h.p. engine he flew from Douai to Mourmelon in an hour and a half, deducting the time taken for a stop at Rheims. He carried two passengers, besides 410 kilogs. of tools and spare parts, including a complete fire extinguisher. On the following day he flew over to Vesoul.

The manœuvres proper commenced on Monday, but on Sunday last a very great deal of flying was seen, large crowds being attracted to the neighbourhood. One of the finest flights was made by Lieut. Chevreau, who was in the air for 4½ hours, while Loridan was flying on and off with an observer practically all day. Very complete arrangements have been made for the repair of the aeroplanes, several motor lurries, &c., being fitted up as repair shops in addition to the workshops at the headquarters of the two armies. The system of dropping messages from aeroplanes by means of loaded bags did not prove very successful, several of them being lost, but in a good many cases the aviators on landing mounted a horse and conveyed their reports to their superior officers personally. On Monday the wind was very bad indeed, but despite the unfavourable conditions very good work was done.

AIRSHIP NEWS.

A New Astra Dirigible.

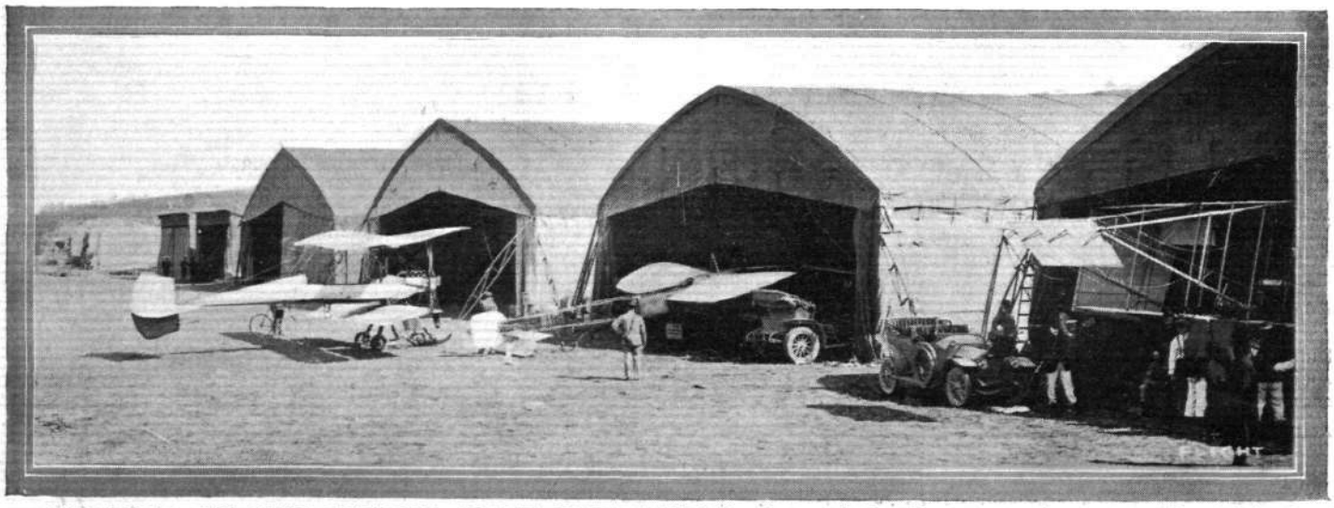
ON the 7th inst. a new dirigible named the "Adjutant Reau," built at the Astra Works on Bayard-Clement lines, made its first appearance in the open at Issy, and on the following day it made its first trial trip. It was in the air for five minutes under the hour, and passed over Vannes, Clumart, Billancourt, Meudon, Sèvres, the Bois de Boulogne, and Auteuil, before returning to its shed at Issy. Before being taken over by the French Government, the airship, which is of 9,300 cubic metres capacity, will probably cruise from Paris to Brussels and London.

"Adjutant Vincenot" Out Again.

AFTER being deflated, overhauled, and having several modifications made, the Clement dirigible "Adjutant Vincenot" was brought out again on the 7th inst., and for an hour cruised over La Motte Breuil and the neighbourhood. The alterations appear to have improved the stability and added to the speed.

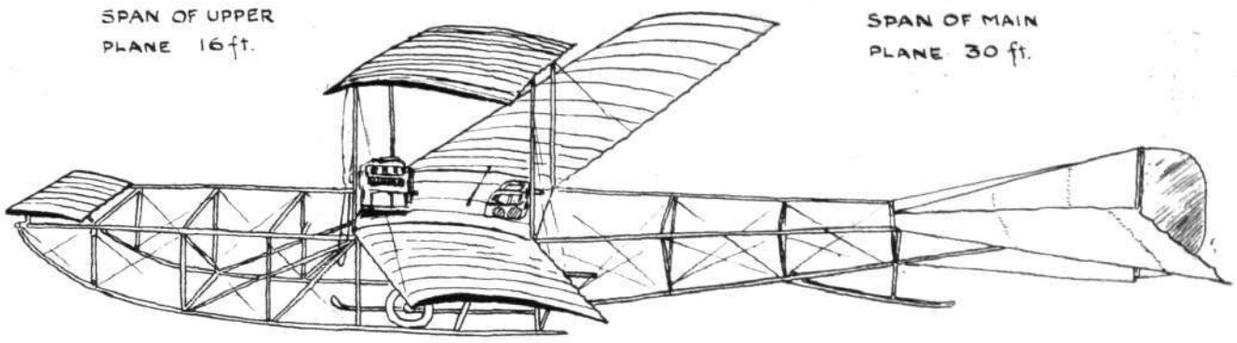
"Schwaben" Visits Berlin.

A SECOND time Berlin has been visited by a Zeppelin airship as on Friday of last week the "Schwaben" cruised from Gotha, and after manœuvring over Berlin for some time landed at Potsdam, where it was to remain for several days with the idea of reviving the flagging interest in the Zeppelin system. A break in the weather, however, decided those in charge to get the great airship near a proper shelter, and so it was hurriedly got under way on Sunday morning, and with a following wind reached Gotha safely after a voyage of four and a quarter hours.



AVIATION AT THE FRENCH ARMY MANŒUVRES.—Some of the Bessonneau hangars at Vesoul, and the military aeroplanes which are giving such a splendid account of themselves.

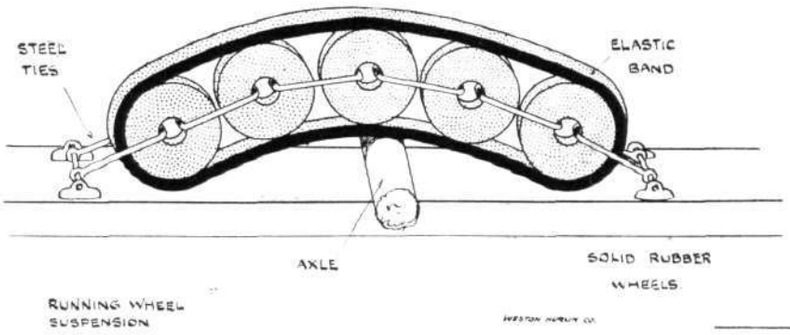
THE WESTON-HURLIN AEROPLANE.



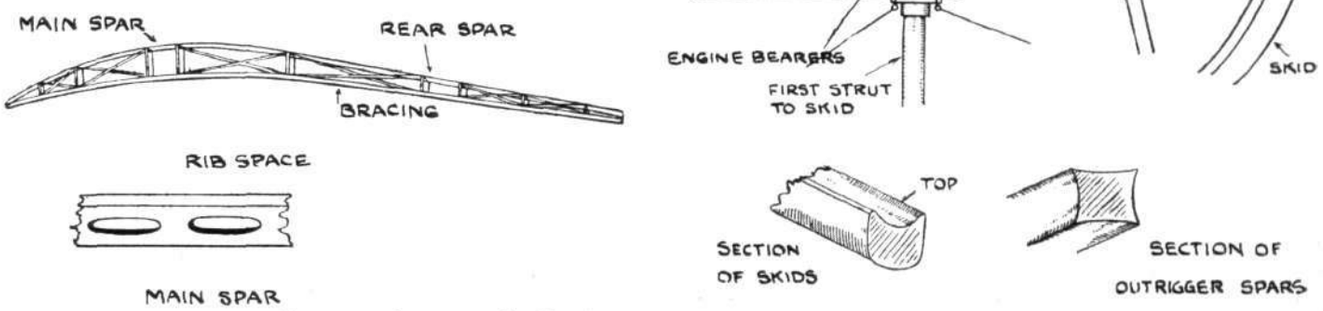
The Weston-Hurlin aeroplane.

THE accompanying sketches have been received from Messrs. Weston-Hurlin and Co., who advise us that the machine in question is about to be tried. It will be fitted with a Webb-Peet rotary engine, and the general lines of the machine differ, as may be seen from the sketch, from accepted practice. The main wings have a V plan form, and measure 30 ft. in span.

There is a subsidiary upper plane of 16 ft. span above the junction of the wings forming a kind of canopy over the engine and pilot. The entire machine is mounted on a large box-girder frame, which also forms the under-carriage. In front is a leading plane, and at the rear is the tail. Some of the more interesting minor details of construction are given in the separate sketches, these including illustrations of the sections of timber employed, and the suspension of the axle on the skids.



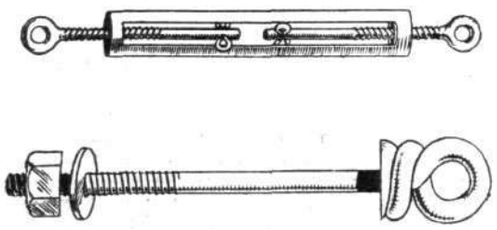
Elastic suspension on the Weston-Hurlin aeroplane.



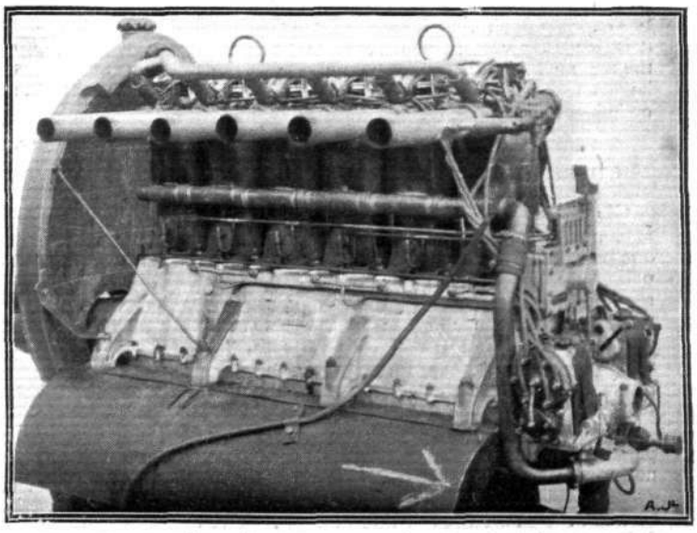
Sketches of constructive details on the Weston-Hurlin aeroplane.

Rubery Owen's Wire-Tightener and Eye-Bolt.

WE show in the accompanying sketch two of Messrs. Rubery Owen's useful fittings for aeroplanes. The first of these consists of a wire tightener made from a solid length of steel of circular section. A slot is cut from end to end, leaving sufficient metal at the extremities for receiving the threaded eye-bolt. By this method of construction the tightener is not only very light and strong, as compared with the ordinary type of wire-tightener of the same size, but it can be effectively locked by inserting split-pins through the ends of the bolts, which render it impossible for the latter to turn. The second fitting is an exceptionally strong eye-bolt made from high tensile steel. The eye is formed by twisting the end as shown. Messrs. Rubery Owen and Co., of Darlaston, specialise in all forms of steel and welded steel work for aeroplanes, such as steel framework, engine brackets, lugs, sockets, and struts.



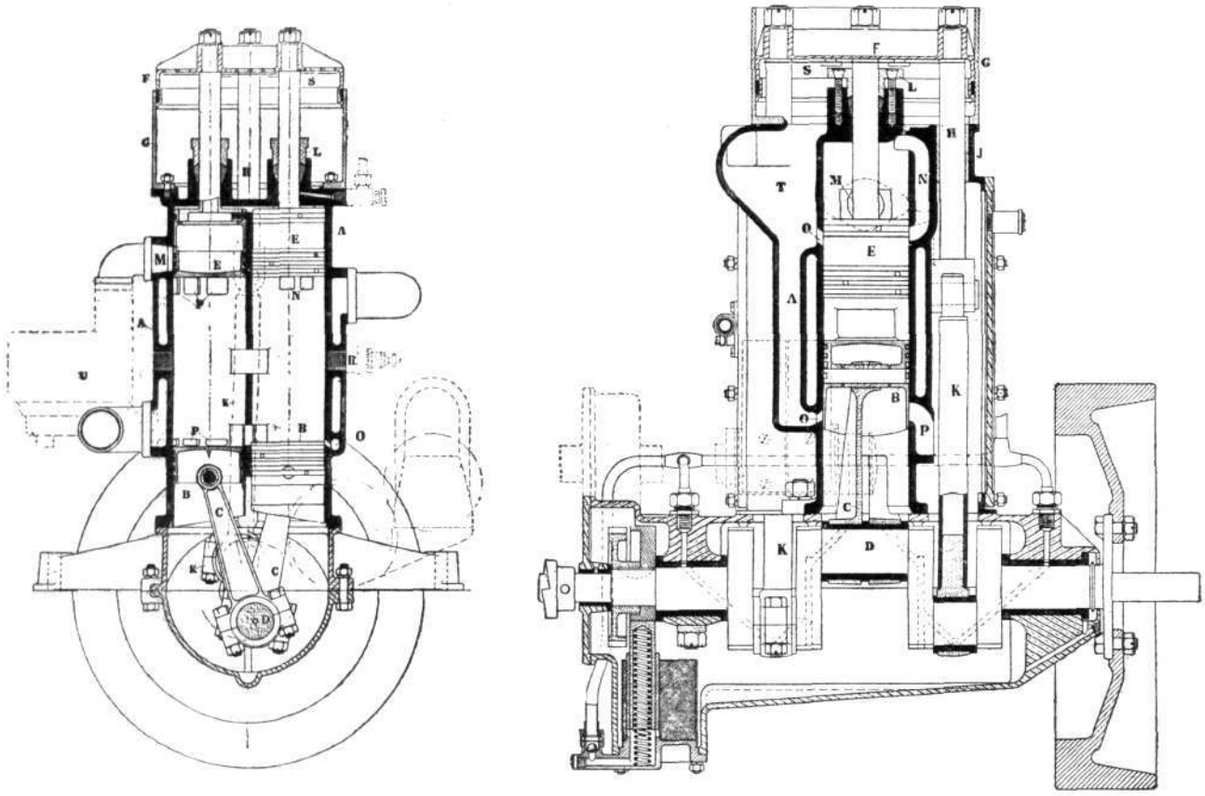
Sketch showing a wire tightener and an eye-bolt manufactured by Rubery Owen and Co.



The Austrian-Daimler Aeroplane engine as fitted to the machines of the Austrian War Office.

GODFREY-EVANS TWO-CYCLE ENGINE.

THIS engine is of the two-cycle or valveless type, and was designed for the inventor, Mr. L. T. Godfrey-Evans, of 21, Westbere Road, London, N.W., by Mr. R. Pentoni. Referring to the diagrams it will be observed that the cylinders, A, are cast in pairs, but that they are connected together by passages at the top, centre, and bottom. Two pistons work in each cylinder, the bottom pistons, B, working through the connecting-rods, C, which are connected directly to the centre pin of the crank-shaft, D; while the top pistons, E, are rigidly connected by tail-rods to the cross-head, F; the latter also forms the piston of a large air-pump working in the cylinder, G. Motion from the cross-head is transmitted to the crank-shaft by means of the two rods, H, working in the guides, J, and the outside connecting-rods, K. A special form of gland, L, surrounds the tail-rods of the top pistons.



Transverse and longitudinal sections of the Godfrey-Evans two-cycle engine.

The cycle of operations is as follows:—Gas enters the cylinders *under pressure* by way of the port, M, and fills the space above the two top pistons, E. On the outward stroke of the pistons this gas is compressed, and just before the conclusion of the outward stroke it is forced by way of the port, N, in the right-hand cylinder, into the main cylinders between the pistons; at the same time the pistons have uncovered the three air-ports, O, admitting pure air to the cylinders under pressure.

It will thus be observed that the previous exhaust gas is forced out of the cylinders from four places at once, leaving through the very large exhaust ports, P, at each end of the left-hand cylinder, both cylinders being filled instead with pure air under pressure from the ports, O, and strong gas from the port, N. On the inward stroke of the pistons the gases are compressed in the ordinary way, the pure air diluting the strong gas, and forming a perfect combustible mixture which is fired simultaneously by two sparking-plugs placed at R. The cycle is then repeated.

The air-pump is a very simple example of a well-known type, and consists, as before mentioned, of a piston, F, working in a cylinder, G.

The piston has a large number of circular ports cut out from its face, and these are opened and closed at the correct moment by means of a very simple momentum valve, S, the air being forced through a non-return valve (not shown) into the storage-chamber, indicated at T, in which it is heated previous to its distribution to the special carburettor, U, and the air ports, O.

The model shown in the diagram represents a twin-cylinder water-cooled engine, but this type of engine is made with any even number of cylinders, and also air cooled.

⊛ ⊛

What is?

Chord. Chord is the measurement of a plane in the line of flight. It is most ambiguous to speak of width of the plane because from one point of view the width would be the chord and from another point of view it would equally well be the span. A spectator regarding an aeroplane from in front would be inclined to speak of the width of the machine, meaning the span of the plane, and his companion might remark with equal truth, "How long the wings are," also meaning the span.

Skin Friction. Skin friction is the rubbing of the air against the surface of the wings and frame of the machine.

Non-Lifting Tail. A non-lifting tail is one in which the tail plane is devoid of camber or is otherwise designed so that it does not contribute to the weight-carrying area of the machine.

Angle of Incidence. The angle of incidence is the angle made between the chord and the line of flight. The angle of trail is the angle made between the tangent to the trailing edge and the chord.

C.G. and C.P. C.G. and C.P. are the centre of gravity and the centre of pressure. The centre of gravity in any mass is located at the point about which a mass will balance in equilibrium in any position. In a model flying machine it may be found experimentally by suspending the model in different positions by a fine thread. The line of the thread produced always passes through the centre of gravity. In flight the centre of pressure, which is the point at which the entire supporting effect might be localised without upsetting the balance of the machine, must obviously be located vertically beneath the centre of gravity. In a model if the gliding flight is a dive head-first, the centre of pressure is too far to the rear; conversely, if the model stalls itself head up then the presssure is too far in front. The centre of pressure cannot be altered without redesigning the model, consequently the correction is made by shifting the ballast so as to bring the centre of gravity into coincidence with the centre of pressure, when the model will then fly steadily. If in a model that is capable of making a steady flight under favourable conditions, there is no natural stability, then any disturbing draught will set up an oscillation that will augment itself until the model capsizes. Conversely if the model is naturally stable the oscillation set up by a disturbance will die out of its own accord.

CORRESPONDENCE.

**** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

Correspondents communicating with regard to letters which they have read in FLIGHT, would much facilitate ready reference by quoting the number of each such letter.

Centre of Pressure.

[1353] Would you kindly let me know how I can calculate the centre of pressure of a cambered plane at various angles? I have looked over my back numbers of FLIGHT and see a description of Mr. Seller's experiments in May 14th, 1910. I also see a remark of a correspondent in a later number, objecting to the positions of the pin holes in Mr. Seller's experiments. It seems to me that Mr. Seller made a mistake in this, and if so, his calculations are not correct.

Would you kindly say is there any reliable data for me to go by, and if so where I can obtain same.

Banbridge. S. B.

[This is one of those subjects that needs the light of more careful experiments. Elaborate mathematical analyses have been suggested as ways of locating the c.p. exactly, but there is little evidence that any one of them is reliable.—ED.]

Bird Flight.

[1354] I have been much interested in Dr. Hankin's account of soaring birds in India.

While not wishing to deny the value of further study of internal stresses in the air, I should like to point out that such soaring is capable of a simple explanation.

If the gliding angle of a bird be 5°, and its gliding velocity 20 m.p.h., its rate of descent in a vertical line is 20 [sin 5°], *i.e.*, 1·75 m.p.h.

If the air have an upward velocity of 2 m.p.h. the bird will be gaining height in gliding at a rate of ¼ m.p.h.

About 10 a.m. in India when the ground is hot, the air is usually rising with at least this velocity, and to all ordinary appearances is dead calm.

Bath. H. D. C.

Aeroplanes in Warfare.

[1355] I must ask reluctantly for a little of your space to answer letter No. 1342, lest Mr. Atkinson or other of your readers should think me guilty of the discourtesy of rushing into print without due consideration, and on subjects of which I am wholly ignorant.

I must point out to Mr. Atkinson that he originally proposed to hit a very narrow target—a road—with a very low velocity projectile dropped from a gun on a most unstable platform travelling at a high rate of speed. The problem of making good practice from a torpedo boat destroyer going at 30 miles an hour with a high velocity gun is easy in comparison.

I do not pretend to much science, but having devoted the best thirty years of my life to gunnery in various forms I am confident that fairly good practice can and will eventually be made from airships, but that it will only be done by careful study and the use of carefully-designed instruments.

As regards other points raised by Mr. Atkinson I may say that there is nothing in common between a telegraphic message which is acknowledged and checked back if necessary, and, if important, sent in cypher, and a message sent by signalling, which is done by flag, heliograph, or lamp, and liable, under service conditions, to interruption and inaccuracy.

As to attacking a dirigible there are at least a dozen descriptions of bombs, or hand grenades, in use to-day, several of which would be suitable for the purpose. Details are to be found in military works by those interested. The crude methods I suggested would of course only be necessary in emergency, and it may well be the duty of an aeroplane to destroy an enemy's dirigible at any risk to itself. One would no more elaborate methods for the use of such crude weapons than one would improvise a drill for using the butt end of a rifle in a scrimmage.

No accurate ranging is necessary one would think, because, as long as the aeroplane keeps directly over the gas-bag, she can approach as near as she chooses without being exposed to rifle fire from the car, but if ranging is needed it must obviously be done by measuring the angle which the length of the gas-bag subtends, and guessing that length, if it is not previously known.

Finally as regards a safe height one would have been grateful to Mr. Atkinson if he gave the reasons on which his opinions are founded. In any case here are mine:—A Maxim gun fires normally about 600 rounds a minute, or 10 a second. A company of infantry, 100 strong, can fire at least twice that number of aimed rounds in the same time. I cannot at the moment find the greatest height of the rifle trajectory, but that of the German 9-pr. anti-balloon gun is about 18,000 ft., that of the rifle with its light bullet might perhaps be 7,000 or 8,000 ft., in any case a sufficient margin. During a reconnaissance over some miles of country an aeroplane might well come within range of 10,000 infantry and many Maxims, of whom perhaps one-third may be so placed that they can fire a few rounds apiece at it without endangering their own people by falling bullets. The German infantry are now instructed to aim from two to ten lengths ahead of an aeroplane according to range. They are also taught good rough rules for adjusting the ordinary sights, which I can assure Mr. Atkinson are far from useless as he supposes. One remembers how easy it is to make fairly sure of a snipe with a large number of small pellets, and how vulnerable an aeroplane is especially as regards the pilot and the propeller. If these reasons do not appeal to Mr. Atkinson we must agree to differ. May I recommend a careful study of an article in the "Mitteilungen über Gegenstände des Artillerie und Geniewesens," No. 1, 1911.

R.A. (Retired).

The Army Airships.

[1356] Can anyone inform me what has become of the Clement and Lebaudy airships presented to our Government last year? Have they been repaired and tested? If not, is it to be inferred that they are too expensive and dangerous to work?

Taken in conjunction with the naval airship, the Government seems very unlucky in its efforts to compete with the French and German dirigibles. With regard to purchase of aeroplanes, I suppose our Government is waiting the results of the French military tests for aeroplanes next month.

Bristol. A. BALFOUR.

Testing Aeroplanes as Gliders.

[1357] At a recent meeting on the Birmingham Aero Club's flying ground at Billesley Farm, King's Heath, a biplane glider of 37 ft. span, and with pilot aboard, was towed by six men against a wind of about 30 miles an hour, and when they had attained a speed of 6 or 7 miles an hour the glider rose easily to a height of about 25 ft.

Now it is obvious that a great deal of the energy of the towers was taken up in moving themselves over the ground, and only a small amount left for raising this huge glider and pilot, and maintaining them in the air at an air speed of 37 miles an hour.

In the face of this simple experiment, does it not seem that a large amount of the power on present day aeroplanes must be running to waste. Where is the fault? The aero clubs should attempt to solve this problem, and much may be done by co-operation in research work.

Birmingham. B. W. BEEBY.

Not 15, but Rising 17.

[1358] I would like to correct a slight error in your paper of this week. You put my age at 15 in your article under the heading, "From the British Flying Grounds," whereas I shall be 17 in December next. This still leaves me as England's youngest certificated pilot, as I obtained my *brevet* at the Bristol school on the 8th inst., after five weeks' tuition. I should like to mention, through the medium of your paper, that a better school for aviation than the Bristol School at Salisbury Plain could not be found in England.

Chiswick. CADET N. F. WHEELER, R.N.

OUR READERS ASK:

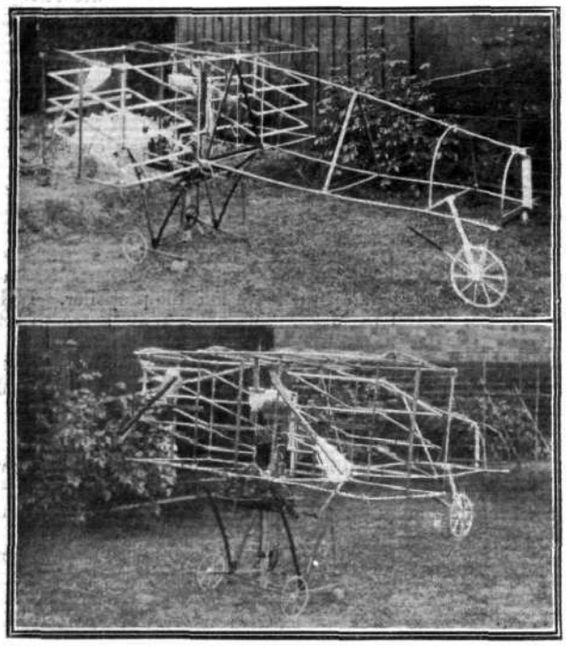
WHY is a clutch not fitted to aeroplanes in order to save the trouble of holding them prior to the start? [1359]

A clutch that is well made and strong enough to transmit 50-h.p. would add appreciably to the weight of the machine, increase the number of mechanical parts, and, thereby, the possibilities of something going wrong. No doubt clutches will be used in due course, but for the moment the cruder method of starting the machine serves the purpose of experimental flight. Moreover, on machines that have direct-driven propellers, the propeller is the engine fly-wheel, and to disconnect it would necessitate putting an equivalent weight in its place.—ED.

MODELS.

Model Construction.

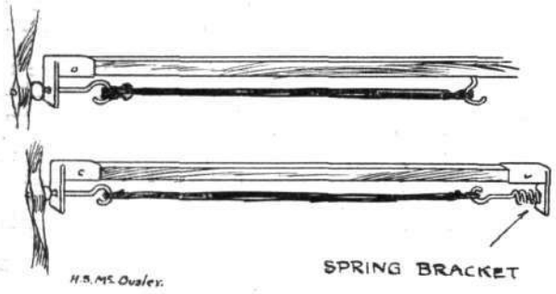
[1360] Perhaps the accompanying photographs of a large model may be interesting to your readers. It is fitted with a ¼-h.p. petrol engine and carries 44 sq. ft. of area. Between the top and bottom main planes is a triplane elevator, which I have arranged to work



automatically for balance. The engine, coil and accumulator are fitted 10 ins. below the bottom plane, thus giving pendulum stability. In front of the planes are two propellers. The span is 6 ft. and the overall length 8 ft.

Macclesfield. F. M. STONE.

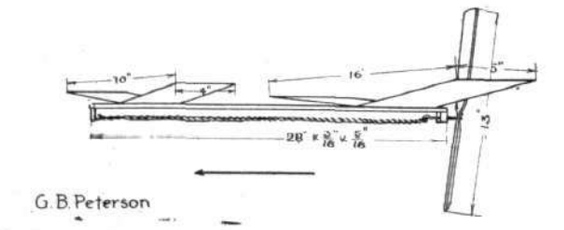
[1361] Enclosed is a sketch of an improvement in elastic motors,



consisting of a spring bracket introduced into the anchorage of the elastic, which I have found to be of some advantage in actual practice.

H. S. MCOUSLEY.

[1362] A model with which I have been able to get flights of 200 ft. is illustrated in the accompanying sketch. The planes are made of stiff bamboo, fastened with copper wire and covered with light paper. They are not cambered, but they have a distinct



dihedral, and the Vee of the elevator is more pronounced than that of the main planes. The propeller seems very large for the model, but gives excellent results.

I have found that the heads of brass tacks with holes driven through them make very satisfactory bearings.

How could this model be made to fly faster and farther?

California. G. B. PETERSON.

IMPORTS AND EXPORTS, 1910–11.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

	Imports.		Exports.		Re-Exportation.	
	1910.	1911.	1910.	1911.	1910.	1911.
	£	£	£	£	£	£
January	2,516	1,196	750	1,088	550	Nil
February	437	3,129	2,950	1,786	—	—
March...	7,516	11,327	128	1,027	600	357
April ...	6,305	2,110	950	807	1,470	4,343
May ...	846	1,707	400	2,471	350	1,972
June ...	7,961	3,225	642	2,432	558	1,682
July ...	11,608	9,822	336	2,256	830	643
August	6,188	2,873	812	2,153	1,455	265
	43,377	35,389	6,968	14,020	5,813	9,262

Aeronautical Patents Published.

Applied for in 1910.

Published September 14th, 1911.

19,798. R. R. A'C. BEADON. Aeroplanes.
23,987. H. D DE M. CAREY. Stability of flying machines.
24,002. A. GROSS AND J. KIRCHBERGER Aerial propellers.
24,697. T. A. HUGHES. Controlling aeronautical machines.
26,902. F. J. HUTCHINSON. Aerial navigation.
27,118. J. F. Webb. Safety alighting attachment.

Applied for in 1911.

Published September 14th, 1911.

343. L. BLÉRIOT. Aeroplanes.
6,527. J. SCHUTTE. Airships.
12,542. C. OSTERMAI. Aerial machine.

PRINCIPAL CONTENTS.

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